

Health and Safety in Industry

Mrs. R.S. PATI

Mrs. A.D. SUDHAMAN

Introduction

What is an industry? It is a set-up where various kinds of raw materials are processed through different methods with mechanical means to bring out useful finished products for man. Now, to procure raw materials, it is another kind of industry, like mining, forestry, agriculture and animal husbandry. There are various kinds of industries like Steel, Chemical, Textile, Leather, Pulp, Ceramic, Jute, Wool. There are numerous kinds of harmful substances in the environment in the industry which the workers come in contact with constantly, which may be hazardous to their health. So it is the duty of the employer to protect workers from such hazards and to provide a safety environment to work to maintain the health, safety and welfare of the workers.

Definition

The joint I.L.O./W.H.O. declaration on occupational health in the course of its first session held in 1953 gave the following statement: "Occupational health should aim at the promotion and maintenance of the highest degree of the physical, mental and social well being of workers in all occupations; the prevention among workers of departure from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological equipment; and to summarise the adaptation of work to man and of each man to his job."

Industrial health includes the subjects of industrial diseases, industrial accidents, toxicology in relation to industrial hazards, industrial rehabilitation and industrial psychology. Ergonomics (human engineering) in industry involves designing of machines, tools, equipments and manufacturing processes, layout of the place of work, methods of work and environment in order to achieve greater efficiency of both man and machine. Application of this has made significant contribution to reducing industrial accidents and to the overall health and efficiency of the workers.

Health of the Worker

Industrial workers constitute only a segment of the general population and the factors that influence the general health of the population also apply equally to industrial workers; i.e., housing, water, sewage and waste disposal, nutrition and education. In addition to these factors, health of the industrial

workers in a large measure will also be influenced by the conditions prevailing in their work place. One of the declared aims of industrial health is to provide a safe industrial environment in order to safeguard the health of the workers and to step up industrial production.

Hazards

The industrial worker today is placed in a highly complicated environment which is becoming more complicated as man is becoming more ingenious. He may be exposed to five types of hazards depending upon his occupation; (a) physical hazards, (b) chemical hazards, (c) biological hazards, (d) mechanical hazards, (e) psycho-social hazards.

Physical Hazards

(1) *Heat and Cold*: Heat is a widespread hazard in most industries and the direct effects of heat exposure are burns, heat exhaustion, heat strokes and cramps. The indirect effects are decreased efficiency, increased fatigue and enhanced accident rates. Radiant heat is the main problem in Steel Industries while stagnant heat is the principal problem in textile industry and mines. Important hazards associated with cold and chilblains erythrocyanosis, immersion foot and frost bite.

(2) *Light*: Poor illumination causes various eye problems and headache. Intense direct glazing will lead to discomfort, annoyance, blurring of vision and resulting accident.

(3) *Noise*: Very great noise which cause great hazard in Steel Industry, weaving machine and printing presses may cause temporary or permanent deafness, interference with communication resulting in nervousness, decreased efficiency and annoyance and blood pressure rise.

(4) *Vibration*: This may cause injury to joints of hands.

(5) *Ultra violet radiation and ionising radiation*: U.V.R. in welding causes severe eye trouble like watering and keratitis. I.R. in X-ray and radio active isotope in medical industry may cause cancer, ulceration malformation and leukaemia.

Chemical Hazard

There is hardly any industry which does not make use of chemicals. They act in 3 ways in workers.

(1) *Local action*: When some chemicals like machine oil and alkalis acid come in contact with skin constantly they cause irritation, itching, ulceration, and finally occupational Dermatitis which is a very common occupational disease. Some chemicals

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get absorbed in the body causing systemic disease like poisoning, anaemia, cancer and such like.

(2) *Inhalation*: (a) *Dust*: Much dust is released into the air during several processes in various industries like mines, steel, foundries, quarry, pottery, textile, wood and stone grinding industries. These dusts are regularly inhaled by workers causing silicosis, Pneumo coniosis, siderosis and various lung disorders. Most common arsenicosis and anthracosis. Pulmonary T.B. is another hazard in steel industry.

(b) *Gases and fumes*: Various types of gases and metal fumes escape into the atmosphere in several industries specially iron and steel exposure to these gases and fumes like Carbon Monoxide, Sulphur Dioxide, Cyanide, are asphyxiating and anaesthetic gases like chloroform and others may cause even death if not checked depending upon the duration of exposure.

(3) *Ingestion*: Ingestion of Chemicals usually by contaminated food or eating by unwashed hands may enter the body and cause systemic disorders.

Biological Hazards

Workers, working in leather industries, wool and other animal products industries are prone to fungal infections, tetanus, hydatidosis, brucellosis, encephalitis, anthrax and so many other infections.

Mechanical Hazards

These centre round machines, protruding or moving parts and poorly installed machines and things like. Many accidents are due to mechanical cause.

Psycho-Social Hazards

These arise from the workers' failure to adapt to an alien psycho-social environment. Frustration, lack of job satisfaction, poor human relationship and emotional tension are some factors which affect the physical and mental health of the worker. Physical factors may also affect the overall mental and physical health of the workers. Therefore psychological problems are assuming more importance than physical & chemical hazards. Industrialisation of any kind will cause general health hazards like (1) Environmental sanitation problems such as housing water pollution, air pollution, Sewage disposal (2) Communicable diseases (3) Food Sanitation (4) Mental health (5) Accidents (6) Social problems and (7) morbidity & mortality. These problems are special & acute in India due to considerably low level of public health. So general health protection of industrial workers against these factors are very essential giving special consideration about malnutrition which causes poor health among workers and low work output.

Prevention and Control of Occupational Diseases

As the saying goes prevention is better than cure. It is the essential duty of the employers to establish a health & safety programme for their work places which would carry out the established safety & health policy among all levels of management & workers. So that an environment free of fear, of ill health & accidents are created for the workers. This can be

achieved if proper preventive measure are taken. They are:

(a) *Engineering measures*: From the design stage action has to be initiated to eliminate the hazards of various types. The type of floors, walls, height, ceiling, roof, doors & windows are to be considered.

— Good housekeeping is a fundamental requirement for the control or elimination of occupational hazards. General cleanliness, food arrangements and general maintenance of the work place and the machineries are very important. The dust which settles down at various places should be removed by vacuum cleaners or wetting agents. Masks, gloves, Aprons and other protective equipments should be kept in proper order in proper places. General ventilation is essential for workers.

— The plant should be mechanised to the fullest possible extent to reduce the hazard of contact with harmful substances wherever possible, to prevent dermatitis and accidents.

— Replacement of harmful material by a harmless one or use of lesser toxicity substance can eliminate many hazards, e.g. substitution of white phosphorus by phosphorus sesqui sulphide in the match industry which resulted in the elimination of necrosis of jaw. Also paints of different types.

— Dust can be controlled at the point of origin by water sprays and wet drilling and wet placing. Enclosure of harmful materials and processors will prevent the escape of dust and fumes in the factory atmosphere. Isolation of offensive process in a separate building protect other workers.

— Protective devices are to be used compulsorily by workers who are taught and trained how to use them and when like respirators and gas masks. Ear plugs, ear muffs, helmets, safety shoes, aprons, gloves, gum boots, barrier creams, screens, goggles are some other safety appliances which should be used regularly.

— Environmental Survey and sampling of factory atmosphere to determine whether the dusts and gases escaping into the atmosphere are within the limits of permissible concentration.

This should be done at regular intervals jointly by doctors and engineers to evaluate the adequacy of preventive measures and occupational health criteria. Research on these factors also helps to improve preventive measures.

(b) *Medical Measures*: The following steps have to be taken as part of medical measures:

— Preplacement examination at the time of employment is the foundation of an efficient occupational health services. A thorough check-up of the recruit will enable the employer either to reject him or to place the right man in the right job so that the worker can perform his duty efficiently without detriment to his health.

— Periodical health check up of employees to rule out the onset of any disease and to treat him accordingly. The frequency of check up will depend upon the type of exposure to the hazards.

— Medical & Health care services care for the worker & the family through employees state insurance scheme, within the factory first aid services should be made available which can reduce suffering and disability & hasten recovery.

— Supervision of working environment by the physician to get acquainted with the surroundings the workers are put up with and the hazards they face and to advise the workers as well as the management accordingly to safeguard the safety & health of the employees.

— Health education of the employees about the risks involved in the industry & the measures to be taken for personal protection, use of safety devices & cleanliness, continuing education through charts & posters and lectures are very essential so that the worker still be always conscious of the dangers he faces.

— Notification of any diseases or accidents in industry is important to investigate, the cause & to improve the working conditions proper records of the incidents help to evaluate the health of the workers.

Legislation: Society has an obligation to protect the health of the worker engaged in diverse industries. And the Factories Act and E.S.I. scheme provide for the health and welfare of the worker and the family.

Accidents in Industry: Accidents are a common feature in industries specially in mines and quarries and construction. The industry as well as the worker lose greatly through accidents. The cause of the accident can be human factors or environmental factors which can be prevented or controlled by proper preplacement examination, adequate job training, continuing education ensuring safe working environments, establishing a Safety Deptt., Periodic surveys for finding out hazards, careful reporting, maintenance of records and publicity.

The accident statistics of Rourkela Steel Plant where I am employed with 40000 employee show a gradual fall of accident rate from 1977-1985. In 1977 it was 543 (fatal 5) and in 1985 it fell down to 121 with no fatal. This is really a very encouraging result. This is achieved through several efficient services. We have a very well equipped safety Engineering Deptt. with well trained personnel who conduct safety training for employees in Deptts. as well placed plant Medical Unit which goes to Deptts. periodically to check up the employees health headed by a Physician, medical check up of employees at the P.M.U., operation of First Aid Units at all Deptts, training of certain employees in First Aid in each Deptt. and of course a well equipped and modernised Ispat General Hospital with all specialised Units to give the best medical care to the workers who are admitted there and from O.P.D.

Industrial Health Nursing

Nurses play an important part in the health and safety of the industrial workers as members of the health team. She will be constantly exercising a

supervisory role with regard to the health of the worker throughout her working day either consciously through the health screening, treatment and health education programme or automatically because of her general interest in and the advice she gives to her patients.

Visiting the work area: This is a controversial subject. Some employers and the nurses express the view that the nurse should not leave the P.M.U. in case she is required to treat an injured worker during the time she would be away. But if she will go for regular visit to the work sites, first of all it will help her to know the whereabouts of everything in each deptt. in case of an emergency. She will be able to check up first aid unit in every department to keep everything in order for use always. She can advise the workers on hygiene, house keeping, toileting and rest areas. She will observe the man at the work, substances he is using, machines he is handling and the working environment in general which will enable her to discover possible problems and in many cases solution to these problems with little difficulty. Many minor problems may present themselves to the nurse which can easily be rectified or improved by discussing the same with the person incharge of the Deptt. The nurse should be kept informed of the changes in the process or working conditions thereby enabling her in turn to advise management regarding possible health risks. She will take note of all the possible health hazards of any kind and advise the concerned workers as well as the authorities as needed.

In the recent years priorities of O.H. nursing have focussed increasingly on the preventive aspects, rather than curative. But treatment service is very necessary function. First aid is the most important thing in the industry. The nurse may be required to give first aid to the injured either in the work area or in the first aid station. For this she should have a well trained first aid team when she will work for the worker she should take care of her own health and safety also. After the patient is being examined thoroughly quickly proper first aid will be given and then shift the patient to the main hospital for their treatment if needed or send him back to work with proper advise as the case may be.

Rehabilitation: Rehabilitation and resettlement, either temporary or permanent, of the worker who has suffered injury or illness which prevents him from returning to his normal work for a period is an important aspect of the industrial health. It is therefore important for the nurse to know what the physical requirements of a particular job are so that the worker may return to his job without ill effects. Hence it is the combined and co-ordinated use of all the available services from the onset of the disabling illness or injury until the individual is returned to normal activity or failing this to highest possible level of functional ability. This is achieved by a team effort between nursing staff at work together with the primary health care team and the hospital staff. It includes medical treatment, educational and vocational training and resettlement in employment as

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Nursing profession and its members. Unfortunately, we failed to grab the opportunity, having no authority and the voice at the decision-making level.

At the centre we are in a most pathetic situation. We have one Officer for all the branches of the Nursing and that too only in an advisory capacity. Advice given may be heard or may not be listened to.

Friends, it's high time that we Nurses of India strive for the separate Directorate at the Centre, as well. We being women in majority in nursing need not be subservient as the traditional culture. Times are changing. There is no dearth of intelligence, knowledge, leadership, vision and dedication required to serve the masses of our great land amongst the nurses.

Please shake up the idea. 'Let some one do it.'

TNAI is the only and the oldest professional organisation recognised by the Central Government and it can convince the Government to establish the separate Nursing Directorate at the Centre.

Fortunately, we have a visionary as our respected Prime Minister, Shri Rajiv Gandhi, who could be approached to do the justice to the members of the 'Noble' profession.

So, dear nurses, this is a call to all the Nurses of India to unite under one banner, TNAI, for the worthy achievement *separate Directorate for Nursing profession* without which the aspirations and the dreams of present and the future Nursing generations will

not be fulfilled. The younger generation is dynamic, full of life and wants something different to utilise their talents. And not 'Just do

what you are told.'

Miss J.D. Powar
Ahmednagar

The Suffering Humanity

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a great sense of dedication and devotion.

Medical Science has undergone a tremendous change with the advancement of science and technology. New medical equipments and medicines are being produced. The developments in this field are very fast. Yet, medical gadgets and medicines only are not sufficient for proper treatment of the patients. The human touch, care, love and sympathy are equally important for an ailing person to recover.

Florence Nightingale, the "Lady with the Lamp", who was the pioneer in the field of nursing had left behind the magnificent ideals of nursing as a symbol of infinite ocean of love and selfless service. Her ideals should still be the beacon-light, the guiding force for Nurses all over the world.

In India, the Central Government and the State Govts. have attached great priority to the extension of health-care facilities to all our people. Programmes have been taken up with a view to achieving "Health for All" by the year 2000 A.D. In this context, the responsibility of the nurses has also gone up. Along with the increase of more and more Health Centres, our country will require

more trained personnel including nurses for catering to the health needs of the people. In this connection, I would like to request the nurses in particular and doctors and health workers in general to develop a liking for working in the rural areas as about 80 percent of our people live in the villages. In our State also, we are giving strong emphasis on extension of medical and health facilities in our rural areas and a number of rural-hospitals and dispensaries are fast coming up. So, my request to all of you is that all of you should extend whole-hearted co-operation in making our efforts successful for making available such facilities to the poor people of the rural areas.

I hope that this conference will enable the nurses, all over India, to sort out their problems and try to remove them through mutual discussion and understanding with the respective State Governments and the Central Government. I am confident that this conference will also inspire them to work for improvement of the nursing care and services all over the country with greater zeal and devotion. I convey my best wishes for a grand success of the conference.

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well as social and emotional adjustment. The industrial rehabilitation officer works hand in hand with the industrial nurse to help the worker to choose another kind of job and provide training so that he can become expert in it and live normally.

Conclusion

In most of the steel plants and large industries of our country there exist a well organised safety, occupational health and medical services for more than two decades. It is time to further their acti-

vities giving more emphasis on preventive, promotive and rehabilitative health care facilities. Since the legal provisions are becoming stringent and employees are becoming more safety and health conscious, many activities in their field have to be organised. The sincere effort of the employees, employers, workers representatives, Govt. agencies and professionals in the field will make it possible to lessen or eliminate the hazards and occupational diseases in the industry.