The Unseen Hazard

There are no legal standards regarding the regulation of stressors as there are threshold limit values or maximum allowable concentration applied to chemicals. Because of the belief that stressors affect each worker differently, they are viewed as a non-objectified category. The so-called “subjective” views of workers should be recognized as objective, verbalized evidence, even where quantification is not possible.

Many industrialized nations have included stress as an occupational disease in their legislation. For example, the Norwegian Working Environment Act deals clearly with psychosocial factors within the workplace which affect the physical and mental health of the worker. It provides legal sanctions to regulate production methods, work organisation, working hours and payment systems that cause harmful psychological and/or physical effects on workers. While regulating the job design, it takes care of the need for employees’ self-determination and maintenance of skills. The Act also recommends that in the planning of work and design of jobs, monotonous, repetitive work and machines and assembly line work that does not permit alteration of space are to be avoided. It provides necessary training to the workers to understand the work systems and any changes therein. The Norwegian legislation recognizes stress as a direct result emanating from the workplace.

Stresses are inherent in work. They can only be minimised by accepting the fact that they exist and affect the health of the workers. The non-recognition of it will not only create more “careless workers” but will create a diseased society. It is necessary to consider stress as a legitimate item for occupational health and safety. If we have to be preventive, we must give greater attention to centrality of work, as the unregulated work system itself creates ill-health which workers do not keep on the lock board of the factory but take back to their homes and to the community. We must examine the intrinsic nature of the work, whatever the sector it might be, starting from vendors on the streets and home-based workers to workers in highly mechanized units, since every unregulated work has its adverse effects on the workers, physically and mentally.

SOCIETY FOR PARTICIPATORY RESEARCH IN ASIA
What is Stress

The term stress in the language of engineering is "a force which deforms bodies". In biology and medicine the term usually refers to a process in the body for adapting to different influences, changes, demands and strains to which the body is exposed. The process is activated not only due to physical exposure, as when a person is physically assaulted on the street or exposed to toxic substances or to extreme heat or cold, but also by unpleasant mental and social conditions created at workplace, as when the worker is insulted by the supervisor, harassed by superiors or the police, the high expectations of production which the worker is not capable of, uncertainty of income and of retaining the job.

The body always responds to certain influences, demands and strains, and some level of stress, as a result of these influences, is always found in the body. The level of stress increases as the outside demands and influences on the body increase. The stress level is related to the rate of wear and tear on the body affected by the external influences, demands and strains. The problem is not in the wear and tear of the body, but the degree or the rate of wear and tear to which the body is subjected to, i.e., the degree of stress.

Stress reactions can arise at work due to a series of factors. A worker's position in the production process or assembly line can cause stress. A worker-workplace mismatch causes stress.

It is like a badly fitting shoe: environmental demands are not matched by individual ability, or the workplace expectations do not take care of the individual needs and expectations.

The important worker-workplace mismatches are:

1. Quantitative Overload - too much to do, time pressure, repetitious work flow in combination with one-sided job demands and superficial attention.
2. Qualitative Underload - too narrow and one-sided job content, lack of stimulus variations, no demands on creative problem-solving, low opportunities for social interaction.
3. Role conflicts - multiple demands at work and non-work situation.
4. Lack of control over one's own situation - when someone else decides what to do, when, and how or when there is uncertainty in the situation.
5. Lack of support - lack of support from supervisor, fellow-workers, and management.
6. Physical stressors - noise, high and low temperatures, level of light, humidity, ventilation, life-threatening accident risks and chemical hazards.

In actual work conditions, workers are usually exposed to a combination of the above factors. However, some work situations have some specific stressors. For example, in the assembly line of mass production units, work has been fragmented minutely. In these units, each specific job is remotely related to the end product. The worker is not only at a distance from the end product, but also at a distance from fellow workers since the work content and place is determined by the machine system. All this usually results in monotony, social isolation, lack of freedom and time pressure. And those in turn act as stressors upon the worker.

Piece rate workers also face specific stressors. Whether the piece rate workers work in mass production or home-based industries, there is a necessity and desire to earn more in a given time. This pushes the worker to work harder, ignoring mental and physical problems like tiredness or nervous trouble. Often the workers are indirectly pressured not to demand better and safer workplaces. Since the risk of accidents and occupational hazards are great, this pressures workers to work harder.

Shift work also exerts specific stress on the workers. It alters the body's natural, daily or normal system. Besides the physiological problems, an irregular work schedule affects many non-work activities, like spending time with the family, or attending social functions, etc. This acts as a social stressor.

Stress Reactions and Ill Health

Stress reactions at work are usually characterized in terms of
emotional reactions.
behavioural reactions
physiological reactions

Different reactions within each category are the categories often coincide.

Emotional reactions are subjective elements of stress reaction. They can be feelings of anxiety, depression, uneasiness, apathy, alienation etc. All the above reactions are usually seen when the worker faces the following conditions:

- inability to leave the work process even for short periods during the working day;
- work processes that are controlled by others;
- no option to take new initiatives or decisions;
- great demands on concentration and attention;
- quantitative overload;
- qualitative underload;
- insufficient time to carry out assignments or work tasks;

- insufficient instructions and support from supervisors;
- monotonous work.

Work-induced stress affects work and non-work behavior. The workers experiencing work stress at work may turn to alcohol abuse and/or increased tobacco consumption. Some exhibit risk-taking behavior at the workplace or outside. Some react with aggressive violence, or other types of anti-social behavior. Some commit suicide or try to do so. The other types of behavior at work place may be categorized as:

- Active behavior (eg, grievances, going slow, strikes, turn over, reluctance to take on certain jobs);
- Passive behavior (eg, resignation, low motivation, indifference to product quality, absenteeism). In some cases, it has social spill over effects.
- lowered life satisfaction, lowered political and cultural activity.

A series of biochemical changes occur in the body as an effect of stress. These include:

- releasing hormones which affect the rate of metabolism;
- increase in pulse rate to provide increased blood supply to the heart and striated muscles (causes muscular tension, pain in the neck, head, shoulder, dryness of throat and mouth);
- increase in cholesterol and fatty acids in blood;
- increase in production of blood sugar;
- increased secretion of gastric acid in the stomach.

It is true that all these problems are temporary. They disappear with the discontinuation of stressful exposure. But prolonged exposure may provide reactions which in the long run may become disease producing. Stressors act together to produce greater stress. For instance, workers exposed to solvents and dust get more skin problems if they are exposed to stress.

**Identifying Stress**

Stress and health effects can be identified by periodic interviews, medical checkups and surveys. Recording the changes in pulse rate, blood pressure, muscle tension and galvanic skin responses during work, after work, after rest and over a time period would give indications of the presence of stress.

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**WORK-RELATED STRESSORS**

Physical & Chemical
noise
heat and cold
vapors
faulty equipment
Psychological
overload or monotony
role conflict
isolation
sex of control over work
near-accidents

Social
unemployment
weak company
frequent job changes
bureaucracy
shiftwork/overtime
sexual/racial discrimination

**PERSONALITY & EXPERIENCES**

health
age and sex
skills and needs
orientation to authority
rigid vs. flexible

**STRESS REACTION**

Emotions
disatisfaction
anger/frustration
depression
irritability/loneliness

Actions
slowed reaction time
poor co-ordination
arguments
drug use
sexual difficulties

Body Functions
fatigue/insomnia
indigestion/ulcers
high blood pressure
heart attacks
backaches/arthrits
skin rashes
more infections

cancer

**SOCIAL SUPPORT**

work groups
friends/family
union
health & safety committee
laws
political action

*Contd. on page 3*
In Bombay, a group of city-based trade union activists, doctors, lawyers, journalists, engineers and environmentalists have decided to set up a forum to monitor the health and safety conditions in the factories of the city. This forum will be called "The Occupational Health and Safety Centre". The Centre aims to eliminate hazardous conditions at the workplace and apprise workers of health and safety information and related legal rights. The Centre also plans to start classes on issues of health and safety and worker-management agreement. It also proposes to set up expert advisory committees to conduct studies in various aspects of environmental hygiene at the workplace and will organise training programmes on the effects of hazardous chemicals, international safety norms and accident prevention. The first planning meeting of the Centre was convened on February 13, 1988.

For detailed information contact: Gayatri Singh & Vijay Katie, OHS Ad-Hoc Committee, 4th Floor, Engineers' House, 86 Apollo Street, Bombay - 400023.

The US Energy Department estimated around Chemtolyk in the Ukraine could get cancer in the next 80 to 70 years. An article in the Communist Party paper of the USSR described the US estimate of the possible death toll as being too pessimistic.

Chlordimeform, a widely used pesticide, which is a cancer threat to humans, is being dumped in third world countries. It is sold under the trade name of Caledron and is promoted for use in cotton crops. Chlordimeform was first commercially produced in the 1960s. It was originally used against insects and pests of fruits and vegetables like apples, pears, cabbages and broccoli. In 1976, the pesticide was taken off the market after it was found to cause serious toxic effects. In 1978, the pesticide was reintroduced for use in cotton crops only. Chlordimeform poses serious threat to health including the risk of cancer. It also causes vomiting, dizziness, skin rash, hemorhagic cystitis (inflammation of the bladder), breathing difficulties, etc. Because of its toxicity chlordimeform has been banned in Australia, Cyprus, Denmark, New Zealand, USA, West Germany, Thailand and Pakistan.

Residents near the Asian Rare Earth (ARE) factory in Bukit Merta (Perak), Malaysia are suffering from serious health problems. The residents presented medical evidence to the Ipoh High Court in January 1988 and demanded the closure of the ARE factory and payment of compensation. The construction of the dump site was halted as a result of protests by residents and concerned individuals. Members of two organisations, the Consumer Association of Penang (CAP) and Sahabat Alam Malaysia (SAM), who have been involved in campaigning against occupational and environmental hazards have been detained indefinitely by the Malaysian Government under the Internal Security Act. Residents of Papan and Bukit Merta continued to protest and formed the Perak Anti-Radioactive Committee.

Vyavasyak Swasthya Swaraj Mandal, the Baroda-based group of worker activists working among their fellow industrial workers on the issue of occupational health and safety, organised a safety exhibition on 23-24 February, 1988 at Nandesari Industrial Estate, 12 km away from Baroda. Safety manuals, booklets and posters were displayed, and a video film prepared on the local occupational health and safety situation was screened. Special arrangements were also made to facilitate discussion among the interested workers on the issue of health and safety. The National Institute of Occupational Health and Industrial Hygiene also participated in the exhibition.
An article on "Whole-Body Vibration and Low Back Pain" in the International Archives of Occupational and Environmental Health 1987 Vol 59, reviews current research into the effects of whole-body vibration. Workers who operate certain vehicles may be exposed to mechanical vibration for prolonged periods. Those affected may include bus and lorry drivers, operators of excavators and other earthmoving equipment. Signs of early degeneration of parts of the spine had in many cases been confirmed by X-ray examination. The researchers recommended improvement in the design of the vehicles to minimise vibration and increase comfort for the operator, together with a reduction in the hours of exposure.

Over 5,000 victims of Oleum gas leakage from the Sri Rani Food and Fertilizer Factory in December 1985, have filed claims for compensation amounting to over Rs. 5 crore.

Electrostatic shields are widely promoted for VDOs to prevent skin and eye irritation. A skin specialist in Sweden who saw 150 VDO operators with facial rashes became suspicious of these shields. This prompted a study of working conditions in 20 offices using shielded VDOs. The study showed that of 100 electrostatic shields in use for more than 5 months, not one shield retained its shielding capacity. It is recommended to use new VDO models without static fields, particularly when operators develop skin problems. (M. Berg and L. Langlet, "Defective Video Displays, Shields and Skin Problems").

The Rotary Club, Madras and the Indian Association of Occupational Health and Employees' Federation of Southern India organised a one-day seminar on Occupational Health on March 26, 1988 in Madras. It was reiterated in the seminar that though protective legislations were enforced "thoroughly, we have our own limitations" due to the problems of high unemployment and the "very many" occupational hazards associated with each industry. The participants of the seminar felt that the problems of occupational health could be taken care of in the organized sector, but it was difficult to do so in the unorganized sector like handloom or handicrafts.

How much weight can a worker carry? The International Labour Organisation recommends a limit of 55 kg for an adult male worker. In India, the limit set for dock workers is 100 kg, while in the unorganised sector it reaches a limit of 115 to 135 kg. The unobservance of a load ceiling — suitably adjusted to the age, sex and physique and other conditions such as the distance, the number of steps involved, and the percentage of time spent on manual lifting — can cause serious back injuries to the workers.

Prevention of Adverse Stress Effects

The first and foremost condition to prevent stress is to accept the prevalence of stress at the workplace. The prevention of stress requires a series of measures:

- Structural measures — to improve the content and organisation of the work process, cooperation and employer participation.
- Improved work environment in individual work places — monitoring the noise level, illumination, chemical hazards, incident hazards etc.
- Measures to increase resistance and increase vulnerability — through health care, training in coping and conflict resolution, problem-solving etc.

- Measures to increase interaction amongst fellow workers and other social supports.
- Social measures to increase, organize and vitalise the workers' own resources and power to cope with their own and each other's problems.

How to Treat Stress

Redesigning the job and work environment to suit the worker is the best way to eliminate stress. When this cannot be done, there are other possibilities but not the final solution. Possibilities might exist to increase resistance and decrease vulnerability by physical exercises, relaxation etc. This is often useful because it helps to expand the pent-up energy produced by stress. Besides this, there are other medical and psychological aids generally administered by trained doctors and psychiatrists to relieve workers from stress.

When a person is under stress, the following should be kept in mind:

- Don't tell a person that he/she should take hold of himself/herself... try to help him/her to help himself/herself.
- Show consideration and don't be too hard on those who are especially prone to depression, fatigue and anxiety.
- Give a chance to stressful persons to speak their minds. Don't begin to advise.

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On 2 April, 1988 a worker died in one of the factories located on the G.T. Road, Ghaziabad, Uttar Pradesh. The worker was drawn into the machine while working in the night shift, and got crushed.

On 15 March, 1988, 100 persons suffered from exposure to ammonia gas which leaked at the Bombay Carbon Dioxide Company's factory at Chembur. The victims suffered several ailments such as giddiness, nausea, breathlessness burning throat. The victims could have been more seriously affected if the leak had not been controlled in time.

The Maharashtra Pollution control Board (MPCB) has not yet given a 'No Objection Certificate' (NOC) to the company. The company has obtained the license from the municipal authorities.

Poisonous gas leaked from a plastic factory located at Nangloi in West Delhi on January 22, 1988. The gas leaked just when the process of mixing formaldehyde and phenol started. The process was being conducted in drums instead of the boiler as specified in the industrial manual. The factory owner and foreman were arrested on charges of negligence.

One worker died and five were affected due to exposure to ammonia gas while working in a cold storage located at Jaunpur, Uttar Pradesh.

In the Nandesari Industrial Estate, near Vadodara, a worker died in an accident on March 13, 1988. In the same Estate another worker received serious injuries as he fell from a height of 40 feet, along with a drum containing 325 kgs. of Trichlorophenol.

One worker died and 13 were seriously injured when a centrifugal machine exploded in a factory in Kanpur. One day before the accident, the workers had demanded that the bolt of the centrifugal machine should be changed. The workers of this factory are not covered under the Employees State Insurance Scheme (ESIS).

An explosion occurred in a factory in London which makes special-effects fireworks for James Bond films and rock concerts. In the explosion, one worker was killed and two were injured.
HAZARDOUS AND TOXIC CHEMICALS

The Environment Protection Act – 1986 makes it mandatory on the part of the Central Government to make rules for “the prohibition of and restriction on the handling of hazardous substance in different areas”. The Ministry of Environment (Policy and Law Division) has prepared a draft list of hazardous and toxic chemicals.

Hazardous substance has been defined as “any substance or preparation which, by the reason of its chemical or physical chemical properties or handling is liable to cause harm to human beings, other living creatures, plants, micro-organisms, property or the environment”. Handling has been defined as the “manufacture, processing, treatment, package, storage, transportation, use, collection, destruction, conversion, offering for sale, transfer or the like, of such substance”.

The preliminary list prepared by the Government excludes many substances which could be termed as hazardous and have been banned/withdrawn/severely restricted. Hazard and toxicity are not static terms. The chemicals and mixture of compounds pose a hazard depending on the physical-chemical properties and the actual conditions involved in the production, storage, transport and handling. Some of the factors useful in determining the hazard of the chemicals are:

1. Siting of the industry — proximity to population;
2. Quantity produced and stored;
3. Prevaling meteorological conditions;
4. Nature of design and plant equipment and reliability of instrumentation and safety systems;
5. Inspection and testing procedure for the equipment;
6. Ability of the mixtures of compounds to form explosive and flammable mixtures;
7. The procedure for start up and shut down of plants;
8. The method of disposal of wastes;
9. The levels of chemical concentration in the workplace and ambient air;
10. The storage and transportation system of the chemicals.

There is an urgent need to make an exhaustive list of the hazardous chemicals in a broader framework. It may be remembered here that in April 1985, an ILO mission visited India to advise the government on priorities for establishing a major hazard control system. A major hazard work is one which stores hazardous substances and flammable gases above a specified threshold quantity. The chemicals identified by the ILO mission is included in the draft list. These chemicals have also been listed in the document prepared by the government of India.

The Council of European Communities defined major accident hazard in terms of industrial activity, e.g. alkylation, distillation, nitration and manufacture of nitrogen – containing compounds, etc. They have specified the quantities of chemicals stored or used in connection with a particular industrial activity, products of manufacture, by-products or residues. Indicative criteria have been developed for dangerous substances which include very toxic substances, toxic substances, flammable substances and explosive substances.

Madhusudhan Rao, an active environmental engineer based at Bombay, has prepared a list of toxic chemicals which are excluded in the draft list prepared by the government. The idea of preparing a list as exhaustive as possible is to initiate discussion amongst NGOs and other concerned individuals and with the government so that the list is finalized only after a thorough public hearing and debate. Whether it be setting standards for air, water pollution or making rules under the various acts, the government rarely initiates public debates which are so crucial to a proper formulation of regulations. Rao points out that the hazards of a chemical is determined by many factors.

In the introductory note to the list prepared, Mr. Rao says, “Although an attempt has been made to include as many hazardous and toxic substances, there are a number of chemicals which cause or are likely to cause damage to human beings, living creatures, plants, micro-organisms and the environment. The adequacy of toxicity data is far less than assumed. Inspite of limitations, the collection of data in hazardous and toxic substances should continue. This is a valuable indication of the detrimental effects of chemicals.” In his note he recommends that “for diagnosis and action to be more realistic, an epidemiological study should be carried out which will give an insight into the actual hazardous and toxic nature of chemicals”.

Save Bombay Committee, an environmental group, has already sent the list prepared by Mr. Rao to the Ministry of Environment. Without a more broad based list, the standard to be set under the Environment Protection Act, 1986 will be highly inadequate.

For more information contact: Mr. Kisan Mehta, Save Bombay Committee, c/o Kayal Engg, above State Bank of Travancore, Opp. University of Bombay, Bombay.

(List of hazardous and toxic substances excluded from the draft list of Government of India, prepared by M.G. Rao, for Save Bombay Committee)
The Environmental Activists Handbook

This handbook brings together various legislations pertaining to environmental pollution, particularly industrial pollution, as also judgements delivered by courts so as to enable activists to formulate their legal strategy. It also contains a compilation of various court judgements on different environmental issues. Though the focus of the handbook is on legislations and legal cases, the authors maintain that "it cannot be over emphasised that approaching courts is appropriate only under certain conditions and can never be a substitute for direct people's action". Edited by Gayatri Singh and Madhusudhan Rao.

Available from: Gayatri Singh, Engineers House, 4th Floor, 86 Apollo Street Bombay-400023

Chemicals — Hope and Responsibility; Proceedings of the ICFP WOMEN'S WORLD CONFERENCE

The Women's World Conference was held in Brussels from October 13-15, 1987. The deliberations at the Conference focussed on the continuing debate of whether, in the process of development, human beings should do everything that is technically possible, and whether this is ethically justifiable. The report contains some relevant papers and discussions on Environment, Safety and Health in the Federal Republic of Germany, Workplace Cancer Screening, and health issues related to women.

Available from: The International Federation of Chemical, Energy and General Workers' Unions, Avenue Emile De Beca 109, B-1050, Brussels, Belgium.

Health Hazards in the Rubber Industry: An International Survey

This report documents various health hazards within the rubber industry. It describes: the causes of the risks and compares them with internationally agreed guidelines established to protect the workers against such risks. The report reveals that there are vast variations in the practice of industrial hygiene even between similar plants of the same multinational company in different countries. These differences arise not from scientific ignorance of the harm that many of the substances in daily use within the industry can cause, but from management negligence of basic humanitarian responsibilities.

Available from: International Federation of Chemical Energy and General Workers' Union — address as above.

For details, write to: Donna Menges, Groupe de Recherche-Action en Biologie du Travail, Departement des Sciences Biologiques, Universite du Quebec a Montreal, C.P. 8888, Suit "A" Montreal, Quebec. Canada H3C 3P8.

What is Happening with Regard to the Working Environment?

This is the analysis of a survey conducted among members of the unions affiliated to the Swedish Trade Union Confederation, individual safety representatives and Chief safety representatives in the Swedish industry. It covers issues of the members, views on physical hazards in the working environment, accident risks, ergonomic problems, psychological problems and measures for the improvement of the working environment.

Contact: the Swedish Trade Union Confederation, (LO) S - 105 33, Stockholm, Sweden.

Worker Participation in Occupational Health Research: Theory and Practice

This book proposes an action research model taking into account the interest of both workers and academicians in scientific enquiry into occupational health. It stresses that, for worker/scientist cooperation to be effective, ways must be found for the two groups to work on an equal footing. Institutional context of worker participation is analysed taking into account concrete experiences.

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