OCCUPATIONAL HEALTH STUDY & ENVIRONMENTAL MONITORING IN SOME STONE BREAKING UNITS IN NORTH-EASTERN REGION

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ABSTRACT

The Environment Monitoring report shows that the respirable free silica contents of all the 6 units are much higher than the Threshold Limit Value of the dust. The free silica percentage (%) of the dusts is very high in all these stone breaking units ranging from 78% to 90%. The study reveals that the exposure of workers from air borne respirable dust ranges from 2.4 to 20.6mg/m^3, which is nearly 20 to 200 times more than the permissible limits as prescribed by international organizations.A thorough medical examination and investigation like pulmonary function test and chest X-ray were carried out on the selected sample of the workers. After evaluation of the medical examination and investigation reports, it is found that 12 workers are suffering from silicosis. All these workers were exposed to very high concentration of free silica dust and their duration of exposure varies from 5 years to 35 years. The prevalence rate of silicosis in this study is 14.45%. Prevention and even elimination of silicosis is possible but requires a consistent, persistent, and aggressive effort from all who have a commitment to and interest in the health of people at work. Therefore, appropriate dust control measures are to be adopted in these stone breaking units.

INTRODUCTION

Crystalline silica or free silica dust is the most wide spread fibrogenic substance found in nature. If the dusts are freshly fractured then they become the most hazardous. These freshly fractured free silica dusts are generated during the process of stone breaking[1]. These respirable free silica dusts produce a very dangerous occupational lung disease known as 'Silicosis' which is one type of pneumoconiosis[2]. Silicosis is a fibrotic disease of the lung caused by the inhalation of, retention of and pulmonary reaction to crystalline silica[3]. It is a serious and potentially fatal occupational lung disease which is incurable. The prevalence rate of pulmonary tuberculosis is higher within the silicotic cases.

Considering all these things, an *Environment Monitoring and Occupational Health Study* was conducted by Regional Labour Institute, Directorate General Factory Advice Service and Labour Institute, Government of India, Ministry of Labour & Employment, Kolkata at various Stone Breaking Units in North-Eastern Region in India in the month of January, 2010. During this study, Environment Monitoring was conducted at six stone breaking units (one manual and five mechanized). A total number of eighty-three workers from nine manual and six mechanized units were selected on the basis of duration of silica dust exposure. They were subjected to medical examinations and investigations.

AIMS & OBJECTIVES OF THE STUDY

The aims and objectives of the study are as follows:

(i) Assessment of exposure from air born free silica dust through work environment monitoring.
(ii) To identify and evaluate morbidity due to the silica dust exposures by suitable examinations and investigations.
(iii) To diagnose silicosis due to the exposure of free silica dust among the workers who are exposed to free silica during their job.
(iv) To diagnose Pulmonary Tuberculosis among the silicotic workers & suggest treatment & other remedies.
(v) To diagnose the other complications of silicosis among the silicotic workers.
(vi) To suggest remedial measures and make specific recommendations wherever necessary to improve the working conditions and thereby the health status of the workers.

MATERIALS AND METHODS

A. Environmental Monitoring

Air-borne samples of dust were collected at the breathing zone of the workers in different locations of manual (one) and mechanized (five) stone breaking Units. Cyclone separators were used for the collection of respirable dust. Air borne samples of stone dust were collected by using calibrated suction pumps and pre-weighted glass fiber filter paper. Respirable fraction was evaluated using cyclone. For the evaluation of free silica content in the air-borne dust, settled dust were collected from the processes and analysis has been carried out as per NIOSH method[6]. Individual exposure from air borne dust has been measured from the differences of weight of filter papers. Permissible level of the air borne dust has been calculated from free silica content of the dust. Exposure of individual worker has been evaluated on comparison between permissible limit value and amount of dust exposure.

B. Occupational Health Study

A total of eighty-three workers engaged at various manual and mechanized stone breaking units in the state of Tripura were selected according to the duration of silica dust exposure. Out of these eighty-three workers, thirty workers were taken from nine manual Units (Men - 14 & Women - 23) and fifty-three workers were taken from six mechanized (Men – 36 & Women - 10) units. Three workers were absent during the physical examination and investigation. Therefore, eighty workers were subjected to general medical examinations and investigations. Full sized Chest X-ray - PA views of all eighty-three workers were done at different local Radiology Centres. The Chest X-ray was done as per specifications. These X-ray Plates of eighty-three workers were evaluated and matched with the ILO Standard Radiograph for classification of Pneumoconiosis (2000 Version) and codified[4]. Pulmonary Function test (PFT) was performed with the help of Calibrated Schiller's Spirovit-I Spirometer and then the PFT of the workers was evaluated[5].

RESULTS

Table-1A to 1D: Level of Respirable Dust in Mechanized Stone Crushing Units

Unit A					
Location	**Type of Sampling**	**Total Amount of Dust Exposure**	**% of Free Silica**	**TLV of dust[*1] in mg/m^3**	**Free silica content in respirable dust[*2]**
Crusher Operator	Personal	14.29	78.52	0.124	11.22
Under Crusher	-do-	2.4	-do-	-do-	1.88
Under Crusher (Right side)	Static	3.0	-do-	-do-	2.36
Under Crusher (Left side)	Static	6.4	-do-	-do-	5.03

Unit B					
Location	**Type of Sampling**	**Total Amount of Dust Exposure**	**% of Free Silica**	**TLV of dust[*1] in mg/m^3**	**Free silica content in respirable dust[*2]**
Crusher Operator	Personal	18.56	89.28	0.11	16.57
Under Crusher	-do-	13.5	-do-	-do-	12.05
Under Crusher (Right side)	Static	20.6	-do-	-do-	18.39
Under Crusher (Left side)	-do-	7.1	-do-	-do-	6.34

Unit C					
Location	**Type of Sampling**	**Total Amount of Dust Exposure**	**% of Free Silica**	**TLV of dust[*1] in mg/m^3**	**Free silica content in respirable dust[*2]**
Crusher Operator	Personal	6.05	88.17	0.11	5.33
Under Crusher	-do-	9.45	-do-	-do-	8.33
Under Crusher (Right side)	Static	8.35	-do-	-do-	7.36
Under Crusher (Left side)	Static	13.0	-do-	-do-	11.46

Unit D					
Location	**Type of Sampling**	**Total Amount of Dust Exposure**	**% of Free Silica**	**TLV of dust[*1] in mg/m^3**	**Free silica content in respirable dust[*2]**
Crusher Operator	Personal	13.5	85.82	0.11	11.56
Under Crusher (feeding point of big stone on conveyor to crusher)	-do-	10.36	-do-	-do-	8.89
Under Crusher (Storage of Boulders)	Static	13.6	-do-	-do-	11.67
Under Crusher (feeding point of big stone on conveyor to crusher)	Static	20.34	-do-	-do-	17.46

Table 1E: Level of Respirable Dust in Semi-Mechanized Stone Crushing Units

Unit E					
Location	**Type of Sampling**	**Total Amount of Dust Exposure**	**% of Free Silica**	**TLV of dust[*1] in mg/m^3**	**Free silica content in respirable dust[*2]**
Crusher Operator	Personal	4.7	90.88	0.108	4.27
Under Crusher	-do-	5.1	-do-	-do-	4.63
Under Crusher (Right Side)	Static	5.9	-do-	-do-	5.36
Under Crusher (Left Side)	Static	6.0	-do-	-do-	5.45

Table 1F: Level of Respirable Dust in Manual Stone Crushing Units

Unit F					
Location	**Type of Sampling**	**Total Amount of Dust Exposure**	**% of Free Silica**	**TLV of dust[*1] in mg/m^3**	**Free silica content in respirable dust[*2]**
Stone Siever (Powder Stone)	Personal	15.09	83.78	0.12	12.6
Stone Siever (Coarse Stone)	-do-	6.66	-do-	-do-	5.57
Stone Siever (Powder Stone)	Static	18.38	-do-	-do-	15.39
Stone Siever (Coarse Stone)	Static	12.18	-do-	-do-	10.20

Threshold Limit Values
OSHA : Quartz(respirable) 10mg/m^3/(%SiO_2 +2)[*1]
NIOH : 0.05mg/m^3 [*2]
ACGIH: Quartz (respirable) 0.1mg/m^3 [*2]

Table 2: Details of the workers suffered from silicosis

Sl No.	Code Number of workers	Age (Year)	Sex	Code Number of Employer	Duration of exposure
1.	A	60	M	I	5 years
2.	B	35	M	I	5 years
3.	C	42	M	II	9 Years
4.	D	55	M	II	20 Years
5.	E	25	M	II	5 Years
6.	F	42	M	II	18 Years
7.	G	38	M	II	9 Years
8.	H	45	M	III	7 Years
9.	I	29	M	IV	10 Years
10.	J	50	M	V	10 Years
11.	K	50	F	VI	35 Years
12.	L	45	F	VI	25 Years

Table 3: Distribution of workers having silicotic nodules according to ILO codification

ILO Code	Quality of plates		TOTAL	Profusion		TOTAL	Zone involved		TOTAL	Size of opacities			TOTAL
	Gr.-1	Gr.-2		1/1	2/2		All zones of both lungs	U&M zones of both lungs		p/p	q/q	r/r	
Number	11	1	12	10	2	12	10	2	12	7	4	1	12
Percentage(%)	91.67	08.33	100	83.33	16.67	100	83.33	16.67	100	58.33	33.34	8.33	100

DISCUSSION

A. Environmental Study

AIR BORNE DUST: Free silica contents in air borne dust collected from six stone breaking units in Tripura ranges from 78.52 to 90.88. As per recommendation of OSHA, the threshold limit values for respirable quartz ranges from 0.124 to 0.108mg/m^3. A permissible limit value of 0.05mg/m^3 has been prescribed by NIOSH and as per ACGIH, the limit is 0.1mg/m^3. Considering above view, workers' exposure from respirable dust is several times more than safe limit. Among the different types of workers, it has been found that crusher operators are exposed to more dust than other workers. All the workers in all the six units were observed working without any PPE and also almost all the crushing processes are carried out without any control measures.

B. Occupational Health

Twelve persons who have small rounded parenchymal opacities in their X-ray Chest PA View were identified. The Lung Function Test of nine workers shows restrictive abnormality and two workers exhibit normal Restrictive Index. One worker did not appear before the test. All the workers have history of more than five years of occupational free silica dust exposure. They are exposed to high free silica dust concentration at their work place which was more than the permissible limit (detected by environmental monitoring). One worker was taking Anti Tubercular Drug for last 6 months though he exhibited small rounded opacities along with fibrotic changes of lung parenchyma. The worker who did not appear before the medical examination is included in the list only on the basis of history of silica dust exposure and radiological abnormality. Among these twelve workers, five are from a

single stone breaking unit, two from one unit and other five workers from five different stone breaking units. All these workers are suffering from Silicosis.

RECOMMENDATIONS

A. Environmental Monitoring

1. Periodic work environment monitoring is to be carried out throughout the year covering both dry and humid atmospheres.
2. Hazard of air born dust depends on level of free silica; therefore the level of silica content is to be determined for every batch of raw materials.
3. Sweeping of the area is to be carried out using vacuum cleaner.
4. Periodic health monitoring of the exposed worker is to be carried out at regular intervals.
5. Dry crushing process is to be substituted by wet crushing process.
6. All the crushers, if possible, are to be kept under an enclosure with negative pressure.
7. Manual process of stone breaking is to be mechanized with all sorts of control measures for the reduction of air borne levels of dust.
8. Proper action is to be taken to prevent dust exposure of other residents particularly nearby residents.
9. All the workers are to be provided with suitable PPE and the maintenance of PPE should be monitored.
10. The above mentioned recommendations are to be followed for better work environment.

B. Occupational Health

1. Periodical Medical Examination of all the workers engaged in the stone breaking units should be done which include physical examination, Pulmonary Function Test, X-ray Chest PA View with appropriate specification.
2. Dust control measures to be adopted.
3. Workers should always be adequately protected with appropriate Personal Protective Equipment (PPE).
4. Training of workers: the Occupiers shall arrange for suitable training in observing Safety & Health precaution in the form of awareness training programme. Employee training should be designed to influence employees to comply with appropriate work practices. A positive KAP (Knowledge, Attitude & Participation) of the employees should be made through the process of health awareness for the promotion and maintenance of the highest degree of Physical, Mental and Social well-being. Such training should be conducted for all employees periodically.
5. The workers of this study especially those who showed abnormal signs & symptoms as well as abnormal PFT & radiological findings should be continuously monitored. All the workers of the Stone Breaking Units who are potentially exposed to the hazardous free silica dust should be monitored regularly at periodic intervals for the detection of any toxic effect in them.
6. A follow up study should be done after the implementation of recommendations to assess the existing conditions.
7. Silicosis is a Notifiable Occupational Disease as per The Factories Act, 1948. Therefore, the workers who are diagnosed as Silicotic Patients are to be notified to the appropriate authority.
8. Rehabilitation is to be provided to the workers who are suffering from the Occupational Lung Disease "Silicosis".
9. Prevalence of Tuberculosis is high among the silicosis patients. All the twelve workers who contain silicotic nodules in their chest X-ray are required to have thorough health surveillance towards Pulmonary Tuberculosis especially the person who is taking anti-T.B. drugs.
10. Nutritional Status of the Stone Breaking workers and their family are to be improved.

It is recommended that they should be monitored further with appropriate investigations and medical examinations.

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OCCUPATIONAL SAFETY AND HEALTH – CHALLENGES IN INDIA AND SOLUTIONS

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ABSTRACT

OSH is a complex subject, involving a large number of specific disciplines and a wide range of workplace hazards. Therefore a need was felt for quite some time to converge all our efforts under a single umbrella to meet the challenges under a unified policy. Indian Government jointly with other stake holders has given greater attention to the need to adopt systematic models for managing OSH In this direction, a major milestone was the declaration of national policy, on SHE at Workplace. Our National Policy on safety and Health at workplaces (NPSHE) captures all complexities and facilitates us to function coherently and effectively in mitigating the challenges. To keep pace with the new OSH challenges in our country, we are required to have sustainable collaboration with each other and especially with corporate organizations, trade unions, employer/employee committees, professional bodies, R&D institutions & others. The Declaration on Safety and Health adopted in Seoul, Korea at the XVIIth World Congress raises new hopes on increased awareness, continuous education, and the engagement of partnerships at all levels of society to strengthen our efforts to face emerging challenges and to arrive at an acceptable solution to all stake holders. The experiences during the last two decades have stimulated all stakeholders including the most vulnerable section of workers to formulate individual plan to face OSH challenges due to globalization. Many stakeholders realized the possibility of economic outcomes getting influenced sometimes rather by market forces than by efforts through social partners, legal norms or state intervention. The Constitution of India provides detailed provisions for the rights of the citizens and also lays down the Directive Principles of State Policy which sets an aim to which the activities of the state are to be guided. The accelerated economic growth has further necessitated to meet the OSH challenges more effectively and to formulate acceptable solutions for all stake holders. In this connection we may recall the message by the Director General, ILO on the World Day for Safety and Health at Work — 28-04-2010, wherein the "Emerging risks and new approaches to prevention in a changing world of work" was highlighted.

INTRODUCTION

The experiences during the last two decades have stimulated all stakeholders including the most vulnerable section of workers i.e migrant workers to formulate individual plan to face OSH challenges due to globalization. Many stakeholders realized [that due to economic liberalization] the possibility of economic outcomes getting influenced sometimes rather by market forces than by efforts through social partners, legal norms or state intervention. In view of our accelerated economic growth, the need to meet the OSH challenges has become more important now and especially to formulate acceptable solutions for all stake holders. The Constitution of India provides detailed provisions for the rights of the citizens and also lays down the Directive Principles of State Policy which sets an aim to which the activities of the state are to be guided.

Our Directive Principles provide:

- for securing the health and strength of employees, men and women;
- that the tender age of children is not abused;
- that citizens are not forced by economic necessity to enter a vocation unsuited to their age or strength;
- just and humane conditions of work and maternity relief are provided; and
- that the Government shall take steps, by suitable legislation or in any other way, to secure the participation of employee in the management of undertakings, establishments or other organizations engaged in any industry.

These directive principles form the basic guidelines for us to meet the national and international challenges and to formulate appropriate solutions to overcome those challenges. One of the important tools in our struggle to meet this is the guideline available from the ILO Convention No.187[1] and Recommendation No.197 [1]concerning the promotional framework for Occupational Safety and Health (OSH)

The ILO Global Programme on Safety, Health and the Environment (Safe work) [1] indicates that globally 337 million accidents occur on the job annually, while the number of people suffering from work-related diseases is close to 2 million. This amounts to approximately 2.3 million deaths each year, with 650,000 of them due to hazardous substances. The economic burden of poor OSH practices is mounting up. Roughly 1.25 trillion US $ is siphoned off annually by costs such as lost working time, workers' compensation, the interruption of production, medical expenses and others. Thickly populated countries like India has an obligation to rise to the challenges as the human costs are very high.

The challenge to bring down the unsafe act and conditions is ever growing. This is happening in spite of our knowledge about risk management and large numbers of legal instruments, technical standards, guidelines, training manuals, etc. with which we are conversant. The rate of accidents is increasing instead of decreasing. Our economic policy changes have also led to technological advancement and competitive pressures which is sometimes making the occupational safety and health as an afterthought. All professionals have the capacity to anticipate and act for positive change and we must join together to realize this and to reverse the trends.

CHALLENGES AND SOLUTIONS

Need to maintain sustainable OSH Culture: India today faces far more pressure than it did a few years back with

regards to OSH sustainability .The burgeoning population, growing national and international migration of workers, lifestyles, consumption pattern, changes in the socio-economic pattern and other factors have significantly altered sustainability which we have achieved. Therefore building and maintaining a sustainable OSH culture for to-day and for the future is one of the greatest challenges India faces today. We need to have a measureable and practicable roadmap for us. May be that we are required to have a model which has an incentive system as a driving force rather than a penalty system for some selective sectors. This will pave way for competitive and sustainable OSH in the long run.

The need for a stronger and higher will to improve OSH standards: Though in our country we have a number of Occupational Safety & Health (OSH) legislations to provide adequate care, implementation and enforcement mechanisms, the proactive willingness from all stakeholders to have effective mechanism as a part of their normal activity is the need of the hour. OSH issues have to be continually examined, reviewed, and refined by each stakeholder which is done now on piece meal basis for most of the times by many stakeholders.

Lesser opportunities for education and on-the-job training: The importance of imparting OSH education in Training Institutes, polytechnics, engineering colleges, para-medical courses, medical courses is yet to be taken up in a comprehensive manner in our country. There needs to be a serious level of thinking to educate corporate India, individual citizens and important communities like Students, Trade union members, etc. It is very important to speed up our efforts to embed OSH education in a sustainable manner as an integral part of curriculum of selected courses. The level of safety training that is required in industries can be very complex and as well as simple. One of the best way to reach as many employees as possible is through "training the trainers" (TOT) approach. Every stakeholder is required to have at least one trainer in their respective organisation.

Preventive Culture: We are required to practice a culture of prevention within the workplace for OSH measures to make a reasonable headway. Even if all stakeholders practice everything correctly, accidents will still occur if someone shows little regard for their own safety. The process of training and education, in addition to other measures, can go a long way in alerting migrant/vulnerable workers of threats to their well-being. Noticeable change among the workers will influence all our stakeholders including the Government to take proactive approach in all our efforts.

Wider partnerships to integrate all layers of society: No single entity can tackle all the challenges which we face today. Governments can legislate, enforce, and advise. Businesses can educate and perform self-compliance. Workers can push for their rights and strictly observe all safety regulations. If we ensure that all these work together in a coordinated manner, the potential for progress is boundless. International organizations such as the ILO has a large role to play in coordinating and facilitating global partnerships which may help us to achieve our Goal. The various strategies of Indian Government on Occupational Safety and Health have been formulated to synergize the efforts of all these stakeholders.

National OSH Profile: We are required to fast pedal our efforts to prepare national OSH profile. It is an essential initial step in maintaining a good national OSH programme. The profile will be useful for identifying priorities for future action. It can be used as a tool for measuring progress over time through periodic updating of information like accident/occupational data, inventory of resources to manage OSH, etc and will be very useful at national and international levels for policy makers and others functionaries both in Government and private. All organisations are required to have a OSH profile at unit level which will help in improving productivity at unit level and also at national level.

National Policy on SHE at Workplace[2]: OSH is a complex subject, involving a large number of specific disciplines and a wide range of workplace hazards. Therefore a need was felt for quite some time to converge all our efforts under a single umbrella to meet the challenges under a unified policy. Indian Government jointly with other stakeholders has given greater attention to the need to adopt systematic models for managing OSH. In this direction, a major milestone was the declaration of national policy on SHE at Workplace. Our National Policy on safety and Health at work places (NP SHE) capture all complexities and facilitates us to function coherently and effectively in mitigating the challenges.While our unit level policies may vary greatly based on regional cultures, customs, and political situations, we all operate within the relatively broad guidelines set out in our NP SHE. International frameworks like National Promotional Framework for Occupational Safety and Health Convention, 2006 (No.187), Occupational Safety and Health Convention, 1981 (No. 155) etc may also be referred in this regard.

The following essential elements outlined in ILO Convention No.187 help us to understand the salient features of any OSH System:

- Legislation and any other relevant OSH instruments
- One or more authorities or bodies responsible for OSH
- Regulatory compliance mechanisms, including systems of inspection
- A national tripartite advisory mechanism addressing OSH issues
- Arrangements to promote at the enterprise level, cooperation between employers and workers
- OSH information and advisory services
- Systems for the provision of OSH training
- Occupational health services
- Research on OSH
- A mechanism for the collection and analysis of data on occupational injuries and diseases
- Provisions for collaboration with relevant insurance or social security schemes covering occupational injuries and diseases
- Support mechanisms for progressive improvement of OSH conditions in micro, small and medium-sized enterprises, and in the informal economy

Our NPSHE policy outlines strategies for national authorities in consultation with social partners for fulfilling OSH objectives. This helps stakeholders including the social partners, professional safety and health organizations to plan their activities.

Government of India[2] firmly believes that without safe, clean environment as well as healthy working conditions, social justice and economic growth cannot be achieved and that safe and healthy working environment is recognized as a fundamental human right. Therefore stakeholders must focus on this while negotiating our challenges. Education, training, consultation and exchange of information and good practices are very essential for prevention and promotion of such measures.

THE IMMEDIATE RISKS

The following four types of risks are posing major challenges in our country while we continue to make efforts to provide a decent work place.

Physical risks*:* This includes lack of physical activity, poor awareness of heat and cold (particularly among agriculture and construction workers), exposure to heavy physical work, vibration or UV radiation in some occupation.

Biological risks: Risks such as HIV/AIDS, hepatitis, tuberculosis, avian flu, dengue fever, and so on are posing risks which are not even recognised by many of the workers. It is estimated [1] that 320,000 workers worldwide die every year from exposure to viral, bacterial, insect- or animal-related biological risks. The other concern is that due to increased Global trading rate, risk of infection and the difficulty of developing effective responses gets more difficult.

Chemical risks: This is also getting increased due to more use of hazardous substances such as heavy metals, oxides, carcinogens and insecticides. Toxic dusts and fumes are another cause for concern because thousands of workers are getting exposed to these harmful substances in a manner which is not getting attracted.

New categories of exposures**:** Relatively unknown harms from nanomaterials in the workplace is an example for this type of risks.
The worldwide impact[1] of nanotechnology-related products has been predicted to exceed US$1 trillion by 2015. A nanometre-sized particle is smaller than a living cell and can be seen only with the most powerful microscopes. A single nanometre is one-billionth of a meter, compared to human hair, which is approximately 80,000 nanometres in diameter. At nano levels, materials begin to exhibit unique properties that affect physical, chemical, and biological behaviour. Nanoscale materials are increasingly being used in optoelectronic, electronic, magnetic, medical imaging, drugs delivery, cosmetic, catalytic, and materials applications. Potential health issues, including occupational health risks associated with nanomaterials, are not yet clearly understood and this has created another challenge without a solution in the near future.

Stress: Change in work design and organization and the introduction of new technologies or new form of employment contract (including precarious employment) are resulting in increased stress levels. When HIV/AIDS, abuse of alcohol, drugs and tobacco, violence or harassment are added, a serious deterioration of mental and physical health takes place. Further the trend of assigning dangerous, dirty and demanding jobs to contractual employees is also a known disturbing trend.

CHANGING PATTERNS AMONG THE WORKFORCE

Migration: National and International migration of workers is getting fast accelerated. Migrant workers continue to be particularly vulnerable, and generally employed in dirty, dangerous and demanding works, for long working hours. The cultural and communication barriers make those employees to hide their OSH grievances and accept second grade workplace or procedure as a compromise for job security. This needs to be addressed by all stakeholders.

Ageing[1]: In Europe, the 45-64 age group is expected to represent almost half the working population by 2020. We are aware that ageing is an individual process related to genetics and lifestyle. Hypertension, chronic pulmonary or cardiac disease, diabetes, obesity, cancer, neurological disorders, renal and liver disease are more common among the aged. But aged workers offer their employers their experience, knowledge and skills, and continue to be valuable assets. This is possible only when due attention is paid to their safety and health failing which the OSH issues will grow further. We are required to strike a balance to overcome this challenge.

Gender: The increasing percentage of women in the workforce raises a range of questions, including exposure to hazardous substances, the effects of biological agents on reproductive health, the physical demands of heavy work, the ergonomic design of workplaces and the length of work hours. The emerging effect of nanotechnology and previously unexplored health effects of prolonged exposure to nanoparticles may not be the same for women and men. This is a challenge we face today with no convincing solution. The women in the industries like textile, garment, electronics, etc are already having specific health problems which are recognised by most of them effectively but continued vigil is required.

The informal economy**:** The ILO Resolution on Decent Work and the Informal Economy adopted by the International Labour Conference in 2002 highlights the fact that workers in the informal economy experience the most severe decent work deficits. Among these are unsafe and unhealthy working conditions. This is a major challenge our country is also facing today. Our National Policy also focuses attention on all sectors of our economy.

RAISING AWARENESS AND KNOWLEDGE SHARING

The stakeholders must commit to take a leading role in raising awareness of OSH issues and best practices in their respective fields. The dissemination of information is very important.

The Indian Branch of the International Occupational Safety and Health Information Centre (CIS) functioning in

the Central Labour Institute [2] is a specialized unit which is now playing an important role in the collection, organization and dissemination of high-quality OSH information. The CIS bibliographic database, with 70,000 records, is the primary guide to the world literature on OSH, [CIS website is available free of charge and receives about 1.2 million page hits per month.]The "Safe Work Bookshelf" is a CD-ROM (in English and French) that includes the *ILO Encyclopaedia of Occupational Health and Safety* as well as the International Chemical Safety Cards. Guides, codes of practice and training materials are available in printed as well as electronic formats.

To keep pace with the new OSH challenges in our country we are required to have sustainable collaboration with each other and especially with corporate organizations, trade unions, employer/ employee committees, professional bodies, R&D institutions & others. The Declaration on Safety and Health adopted in Seoul, Korea at the XVIIIth World Congress raises new hopes on increased awareness, continuous education, and the engagement of partnerships at all levels of society to strengthen our efforts to face emerging challenges and to arrive at an acceptable solution to all stakeholders.

INSPECTION SYSTEM

Inspection officials are increasingly confronting with new challenges especially on occupational health and safety against the demands arising from the changing economy and the changing perception of the role of factory inspection system. One of the functions of the inspection system is to supply technical information and advice to employers and workers concerning the most effective means of complying with the legal provisions and to bring to the notice of the competent authority defects or abuses not specifically covered by our existing legal provisions. Another challenge for inspectors across India is the regulation of stress caused by work. Though the inspectorates continually review their priorities and activities in order to be seen to be relevant to the current employment climate, at the same time economic crises that involve numerous consequences - relegate questions of improving OSH to second place. Still we have a long way to go to make our system of inspection a fruitful one but cooperation from all stakeholders is a must.

CHANGES IN THE NATURE OF HAZARDS

Heavy industry hazards are getting replaced by new and emerging health hazards (Biochemicals and nanotechnology, etc.). Musculoskeletal issues such as repetitive strain injury from the use of keyboards and other routine manual processes are yet to be addressed in full swing by us. Computer controlled high hazard plants have their own inherent hazards from the complex logic and programming involved in the control systems. Though new systems and high end technologies are coming out, the hazards/risks associated with them are not given equal status. The best live example is the under sea oil leak problem of British gas which has made the U S president to visit the affected area three times in a short period. Therefore we are required to review our available mechanism at least once in a year for risk management. Even if this is not bringing out any new risks but surely identifies existing weakness and the need to strengthen the existing mechanism.

CHANGES IN SOCIAL EXPECTATIONS

In view of the awareness created the few stakeholders are now better informed about the legal and technical matters even and they are increasingly prepared to challenge the authorities for action taken or not taken in mitigating the risks involving a workplace. The Corporate India must make it as a day to day activity to effectively review risks (existing and anticipated) in association with their employees. The recent fatal accident happened during the first week of June in Mumbai highlights the importance of these regular reviews. (Though review was taken in this case, it was not effective).Such reviews will help the corporate to demonstrate that they have taken all possible and reasonable steps for managing their risk.

CHANGING PATTERN OF ORGANIZATIONS

As we are producing high number of technically qualified people, share of self-employed, micro- and small firms in the informal economy also have started to grow. We are also witnessing growth of self-employed workers, peripatetic workers, home based men and women workers. This in one way resulted in decline in trade union membership. Such small industries/units and individual works have also led to loss of corporate memory on past accidents and incidents which previously had been important in improving health and safety standards. The other important aspect is the use of contractors and sub-contractors is getting much widespread. These are the self-employed or the small firms with no or less OSH consciousness. Small support function staff such as cleaning, catering, security and similarly placed workers do not now have the OSH protection or given less protection which were earlier available to them in bigger organisations or before down sizing. Further, in any informal economy, including our country, workers may be deprived of their OSH rights. Such areas are required to be tackled by us through systematic awareness programs and assistance.

THE WAY FORWARD

Since OSH is an integrated process in any production/ similar activity, the stakeholders will have to make a strong case with each other through better co - operation and improved momentum to OSH by entering into new partnerships, besides deepening existing ones. This may be done within a decentralized system of collaboration in areas of common OSH needs.

In any case the objective of our unified action shall be:

1. To continuously reduce the incidence of work related injuries, fatalities, diseases, disasters and loss of national assets.
2. Improved coverage of work related injuries, fatalities and diseases to provide a more comprehensive data base for facilitating better performance and monitoring.
3. Continuous enhancement of community awareness regarding safety, health and environment at workplace related areas as well as continually increasing community expectation of workplace health and safety standards.

4. Improving SHE at workplace by creation of “green jobs” which contributes to sustainable enterprise development.

The above said objective which is integral part of our National Policy on SHE at work place, so that our solutions to face the challenges are always meeting these well defined national objective, is recollected and given below:

THE MEN AND WOMEN ON WHOSE EFFORTS THE INDIAN ECONOMY MOVE, DESERVE THE HIGHEST QUALITY OF SAFETY AND HEALTH THAT WE CAN PROVIDE TO THEM.

REFERENCE

1 ILO web site: www.ilo.org
2. DGFASLI web site: www.dgfasli.nic.in

S. Bharathi
Director (Safety)
Central Labour Institute
DGFASLI
Sion, Mumbai 400 022

SAFETY POSTER

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THE SECOND NATIONAL EXHIBITION OF BOOKS AND FILMS ON OCCUPATIONAL SAFETY, HEALTH & ENVIRONMENT AT CENTRAL LABOUR INSTITUTE, MUMBAI ON 23RD APRIL 2010

Shri A.C.Pandey IAS, Jt. Secretary to the Government of India, Ministry of Labour & Employment, Government of India at the podium delivering the inaugural address. Seated on the dais from left: Shri S.B.Mathur, DDG, DGFASLI, Mumbai; Dr. A.K.Chakrabarti, DG, DGFASLI, Mumbai; Shri G.M.E.K.Raj, DDG, DGFASLI, Mumbai.

The second National Exhibition of Books and Films on Occupational Safety, Health & Environment (OSHE) was organized by Central Labour Institute in Mumbai on April 23, 2010. The exhibition was inaugurated by the Chief Guest, Shri A.C.Pandey IAS, Joint Secretary to the Government of India, Ministry of Labour & Employment, Government of India.

The function started with a song of invocation and lighting of the lamp by the Chief Guest. The Central Labour Instittute will be escalated as a global centre on Occupational Safety & Health within the decade was the hopeful expression expressed by Shri A.C.Pandey while inaugurating the exhibition. He further stated that India is likely to become a leading economy of the world and a workshop of global industrial development within a period of 10 to 15 years. He feels that to fulfill the declarartion of national policy on OSHE, the activities of Central labour Institute and all the Regional Labour Institutes will have to be enhanced to great extent. The present trend indicates that India will emerge as a leader of world development. He also emphasized that rules and regulations can never bring about the required safety culture in the industries. The industrialist will have to come forward to ensure safety and health aspects going ahead of the rules and regulations.

Shri G.M.E.K. Raj, Deputy Director General, DGFASLI, Mumbai welcomed the chief guest and other delegates. Informing about the genesis of this kind of event, Shri Raj told that the idea to organize this kind of exhibition was conceived by Shri S.K.Srivastava IAS, Additional Secretary to the Government of India. He remembered Late Shri N.S.Mankiker, the founder of Directorate General Factory Advice Service & Labour Institutes and hoped this event would prove to be a step in fulfilling his vision.

Dr. Chakrabarti briefed the audience about the formation and activities of DGFASLI organization. He informed that the department has so far conducted ninety national studies, trained two thousand nine hundred students in one year Diploma in Industrial Safety, trained seven hundred and seventy three medical doctors on Occupational Health and trained two thousand students in one month supervisory course for process industries. In addition to above, about two hundred public programmes are being conducted every year which is benefitting about three thousand participants every year. The organization has tested fourteen thousand respiratory and non-respiratory Personal Protective Equipments. The approval for seventy seven flame proof appliances has also been granted by the department. Seventeen prosecutions have been launched against the Port authorities. He also informed that the department is engaged in publishing of a quarterly newsletter INDOSHNEWS on Occupational Safety and Health. He further added that the department's activities were put into public domain through standard reference note every year. With all these services, the trend of accidents in the industries in India has gone downwards. The task is still alarming and there is a need for further performance of the efforts. The department has conceived to form an archive of OSH films so that anyone can get the information about the OSH films. This may bring about a better safety culture in the country. He hoped to institute an award scheme in future for makers of best film on OSH. He also hoped these ideas will find due support in future.

In the present film exhibition, twenty five films on OSH have been entered.

Shri A.C.Pandey, Jt. Secretary to the Government of India, Ministry of Labour & Employment, Government of India cutting the ribbon for the inauguration of book exhibition alongwith the Officers and staff of CLI, DGFASLI, Mumbai.

In the book exhibition, eight leading book agencies across Mumbai participated. In the film exhibition, twenty five documentary films on various aspects of Occupational Safety and Health were screened. The films were educative and spanned over various topics related to Occupational Safety and Health. Shri S.B. Mathur, Deputy Director General, DGFASLI, proposed the vote of thanks. He expressed that the appreciation expressed by the Chief Guest has motivated the team of the officers of the department to further promote such activities to ensure safety and health of workmen. He also thanked all the delegates for their co-operation in making the exhibition a success.

SEMINAR ON OCCUPATIONAL SAFETY AND HEALTH PROVISIONS UNDER BOCW ACT, 1996 ON 7TH MAY, 2010 AT RLI, CHENNAI

The Institute conducted a one day Seminar on *Occupational Safety and Health Provisions under BOCW Act, 1996* on 7th May, 2010. The Seminar was

inaugurated by the Chief Guest Shri A.T.Durai Kumar IPS, Superintendent of Police, Southern Range, Vigilance and Anti Corruption, Government of Tamilnadu in the August presence of Shri G.M.E.K.Raj, Dy.Director General & Head of Department, DGFASLI.

Standing from left: Dr.R.K.Elangovan, Director (Safety) and In-charge & HOO, RLI, Chennai, Chief Guest Shri A.T.Durai Kumar IPS, Superintendent of Police, Southern Range, Vigilance and Anti Corruption, Government of Tamilnadu, Shri G.M.E.K.Raj, Dy.Director General & Head of Department, DGFASLI, Mumbai and Shri K.Balsubramanian, Director (Safety), RLI, Chennai.

Technical sessions on various topics such as Legal provisions for Safety, Safety in Excavation and working at height, safety in use of lifting machines, occupational issues, etc were handled by eminent experts in the field. The Seminar was attended by 62 delegates comprising of senior executives and trade union leaders representing various organizations.

Shri R.Nataraj, IPS, Director General of Police and Director, Fire and Rescue Services, Government of Tamilnadu was invited as Chief Guest in the valedictory function of the seminar. As a part of the Seminar, Diploma certificates and Awards to the students of 27th Batch of Diploma Course in Industrial Safety (2009-2010) were distributed. The Diploma Certificates and awards were distributed by the Chief Guest Shri R.Nataraj in the presence of Shri G.M.E.K.Raj.

INVITING ARTICLE FOR INDOSHNEWS

INDOSHNEWS is a quarterly newsletter that facilitates exchange of ideas and data developed through research, study and surveys in the areas of occupational safety and health. DGFASLI invites articles from individuals, industry, industrial associations, trade unions, professional bodies etc. having information on OS&H and willing to share the same with others at the national and international level.

1. Manuscripts for publication should be typed in double space within 3 to 4 A4 size sheets only on one side of the paper and sent in duplicate to the Editor-in-Chief.
2. Once the manuscripts are accepted for publication, publisher reserves the right to make editorial changes as may be necessary to make the article suitable for publication; and publisher reserves the right not to proceed with publication for whatever reason.
3. Authors should take care to ensure the accuracy of data and reference.

DGFASLI AT A GLANCE

The Directorate General Factory Advice Service & Labou nstitutes (DGFASLI) is an attached office of the Ministr f Labour & Employment Government of India. DGFASL rganization was set up in 1945 under the Ministry o abour, Government of India to serve as a technical arm o assist the Ministry in formulating national policies or ccupational safety and health in factories and docks and o advise State Governments and factories on matters oncerning safety, health, efficiency and well-being of the ersons at workplace. It also enforces safety and healt tatutes in major ports of the country.

The Directorate General Factory Advice Service & Labou nstitutes (DGFASLI) comprises:

- Headquarters situated in Mumbai
- Central Labour Institute in Mumbai
- Regional Labour Institutes in Kolkata, Chennai, Faridabad and Kanpur

Vision* of *DGFASLI: DGFASLI envisions emerging as ar rganization of excellence in creating knowledge ormulating policies, standards and practices to ensure afe and healthy workplaces for all in factories and ports.

Mission of DGFASLI: The mission of DGFASLI is to ender its expertise in occupational safety and health fo volving safe and healthy workplaces in factories and orts through a process of partnership, guidance egulatory activities in specific sector and information haring.

DGFASLI organization comprises of its Headquarters ituated in Mumbai, Central Labour Institute (CLI) in Mumbai, four Regional Labour Institutes (RLI) in Chennai, Faridabad, Kanpur & Kolkata and eleven nspectorate of Dock Safety (IDS) offices located in Mumbai, Jawaharlal Nehru Port, Kandla, Mormugao, New Mangalore, Chennai, Tuticorin, Cochin, Visakhapatnam, Kolkata, and Paradip.

DGFASLI organization consists of a multidisciplinary eam of around 129 officers (engineers, physicians, ndustrial hygienists, physiologists, ergonomists, ndustrial psychologists, commercial artists etc.) and 81 echnical staff members.

Various specialty divisions/cells under DGFASLI office nd Central Labour Institutes in Mumbai include a) Factory Advice Service, b) Dock Safety, c) Construction Safety, d) Awards, e) Statistics, f) Industrial Safety, g) ndustrial Hygiene, h) Industrial Medicine, i) Industrial Physiology & Ergonomics, j) Staff Training, Productivity & Small Scale, k) Industrial Psychology, I) Major Hazards Chemical Safety, m) Management Information Services,) Environmental Engineering and 0) Communication Division. The Regional Labour Institutes are a scaled-down version of the Central Labour Institute and cater to he needs of their respective regions through its specialty ivisions like Industrial Safety, Industrial Hygiene and Medical. The organization is poised to grow further, and neet the increased demands on it. In a developing ountry with a large number of industries having diverse nd complex nature, the task of protecting safety and ealth of workers is an uphill task. Armed with the echnology, good will of the industrial society and the trength of the dedicated staff, the organization is well repared to meet the challenges of tomorrow. It is ommitted to the goal of making the workplace safer.

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CENTRAL LABOUR INSTITUTE: MUMBAI

During the quarter from April 2010 to June 2010, Central Labour Institute carried out several activities of which important ones are given below.

Studies

Assessment of Compressed Breathing Air Quality at a Marine Training Institute in Maharashtra (Metkari, M.A., Industrial Hygiene Division, Central Labour Institute, Mumbai)

Safety Audit at a Chemical Plant in Maharashtra (Gautam, S.S. and Sharma, S.C., Major Hazard & Chemical Safety Division, Central Labour Institute, Mumbai)

HAZOP Study at a Chemical Plant in Maharashtra (Gautam, S.S. and Sharma, S.C., Major Hazard & Chemical Safety Division, Central Labour Institute, Mumbai)

Training Programme

The Safety Division conducted two collaborative training programmes of three days each with NSC Maharashtra Chapter on *Industrial Safety* from April 06 to 08, 2010 and from May 24 to 26, 2010, respectively. Forty-nine delegates from fifteen organisations participated in the programmes.

The Safety Division conducted a three-day training programme on *Occupational Safety and Health– Challenges and Solutions* from June 09 to 11, 2010. Twelve Management Executives from two public Sector and three private sector organizations participated in the programme.

The Industrial Hygiene Division conducted a two-week training programme on *Industrial Hygiene Techniques* from April 05 to 16, 2010. The training programme was attended by one participant from one organization.

The Productivity Division conducted a three-day training programme on *Effective Supervision for Results* in association with Staff Training Division from June 21 to 23, 2010. The programme was attended by eighteen participants from four organisations.

The Major Hazard & Chemical Safety Division conducted a three-day training programme on *Safe Handling of Chemicals for Safety Committee Members of Hazardous Industries* from May 19 to 21, 2010. The programme was attended by eight participants from three different organisations.

The Industrial Psychology Division conducted five training programmes of one-day each on *Behaviour Based Safety* at Bongaigaon Refinery for Executives and supervisors

from June 25 to 30, 2010. In all one hundred and eighteen participants attended the programme.

The Industrial Psychology Division conducted a three-day training programme on *Motivation for Safety, Health and Productivity* from May 24 to 26, 2010. The programme was attended by five participants from two organisations.

Workshops/Seminars/Conference

The Industrial Hygiene Division conducted a three-day workshop on *Selection & Quality Assurance for Effective use of Personal Protective Equipment* from April 28 to 30, 2010. The workshop was attended by eleven participants from six organizations.

The Productivity Division conducted two workshops on *Productivity and Quality Improvements through Effective Employee Participation.* The first workshop was conducted from May 18 to 20, 2010 which was attended by thirty-eight participants from seven organisations. The second workshop was conducted from June 15 to 17, 2010 and was attended by forty-five participants from five organisations.

The Major Hazard & Chemical Safety Division conducted a workshop on *Hazard & Operability Study* from April 07 to 09, 2010. Three participants from three organisations attended the workshop.

The Major Hazard & Chemical Safety Division conducted a one-week workshop on *Dispersion Modeling and Impact Calculation* for fifteen Government officials from April 26 to 30, 2010.

The 50th Conference of Chief Inspectors of Factories was organized by DGFASLI, Mumbai in association with CIF, Uttar Pradesh. The conference was held from April 07 to 09, 2010 at Mathura, Uttar Pradesh. The Conference was inaugurated by Shri S.K.Srivastava IAS, Additional Secretary to the Government of India, Ministry of Labour & Employment and presided over by Shri R.C. Srivastava, IAS, Principal Secretary, Department of Labour, Government of Uttar Pradesh. Dr. A.K.Chakrabarti, Director General, DGFASLI, delivered the key note address. The conference was attended by twenty four Chief Inspectors of Factories from various States/Union Territories besides officials from DGFASLI.

Paper/Presentation/Talks

Shri S. Bharathi, Director (Safety) delivered a talk on *Accident Prevention for Safety Committee Members* at Mumbai Port, Mumbai on April 05, 2010, organized during their Safety Week Celebrations benefitting thirty five Management Executives and Supervisory level Officials.

Shri P.K.Mohanty, Deputy Director (Industrial Psychology) delivered a talk on *Structure and Function of Safety Committee* at Central Labour Institute, Mumbai during the programme conducted by Mahrashtra Council for Industrial Safety on April 08, 2010 and on May 25, 2010. The programme was attended by twenty six participants from nine organisations for the first time and by twenty six

articipants from fourteen organisations for the second time.

REGIONAL LABOUR INSTITUTE, KANPUR

During the quarter from April 2010 to June 2010, Regional Labour Institute carried out studies, training programmes etc. which are described here.

Studies

Safety Audit at a Hydro Development Unit in Uttarakhand (Dwivedi, S.K., Srivastava, K., Safety Division, Regional Labour Institute, Kanpur)

Assessment Study on Status of Safety, Health & Work Environment in Sugar Industries in Uttar Pradesh (Brij Mohan, Bhattacharya, C., & Srivastava, K., Industrial Hygiene Division, Medical Division and Safety Division, Regional Labour Institute, Kanpur)

Regional Project on Prioritization of Major Accident Hazard Factories in Uttarakhand (Guatam, S.S., MH&CS Division, Central Labour Institute, Mumbai and Brij Mohan, Industrial Hygiene Division, Regional Labour Institute, Kanpur)

Training Programmes

The Institute conducted a three-day training programme on *Prevention & Control of Fire in Industries* from April 13 to 15, 2010. Fourteen participants from seven organisations participated in this programme.

The Institute conducted a three-day training programme on *Safety & Health in Sugar Industries* from April 27 to 29, 2010. Thirty two participants from fourteen organisations participated in this programme

Paper/Presentations/Talks

Dr.Brij Mohan, Dy. Director (Industrial Hygiene), delivered a talk on *Safety & Health for the officers of the Ordnance Factories* in a seminar organised by the Ordnance Factories Institute of Learning (OIFL), Kanpur on May 19, 2010. The seminar was attended by twenty delegates.

REGIONAL LABOUR INSTITUTE, CHENNAI

During the quarter from April 2010 to June 2010, Regional Labour Institute carried out following technical activities

Studies

Safety Audit at a Car Manufacturing Plant in Karnataka (Elangovan, R.K., Industrial Safety Division, Regional Labour Institute, Chennai)

Workshops/Seminars/Conference

The Institute conducted a two-day seminar on *Dispersion Modelling and Impact Assessment of Toxic and Flammable Releases* from June 24 to 25, 2010 for the executives of various chemical industries. The seminar was attended by eleven delegates from nine organizations.

The Institute conducted a one-day workshop on *Modern Techniques of Inspection for the Factory Inspectorate with Specific Reference to Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996 and Rules* on June 22, 2010 for Inspectors of Factories. A total number of thirty seven Deputy Chief /Inspectors of Factories, Inspectorate of Factories Government of Tamilnadu attended the workshop.

Paper/Presentations/Talks

Dr.R.K.Elangovan, Director (Safety), delivered a talk on *Legal Requirements under BOCW Act and Rules and Factories Act* in a seminar held at Larsen & Toubro, Chennai on May 05, 2010 for the benefit of thirty management executives.

Dr.R.K.Elangovan, Director (Safety), delivered talk on *Statutory Provisions for Construction Safety in India* in a programme organized by Greentech Foundation at Cida de, Goa on June 25, 2010 for the benefit of one hundred and fifty delegates.

Dr.R.K.Elangovan, Director (Safety), delivered a talk on *Legal Requirements under the BOCW Act and Rules and Factories Act* in a seminar on *Occupational Safety and Health Provisions under BOCW Act, 1996* held at RLI, Chennai on May 07, 2010.

Dr.R.K.Elangovan, Director (Safety) delivered a talk on *Safety Aspects of Mobile Cranes* in the *Simulator Training Programme* organized by J.M. Baxi & Co. and NALCO, Chennai on June 23, 2010. The programme was attended by thirteen participants.

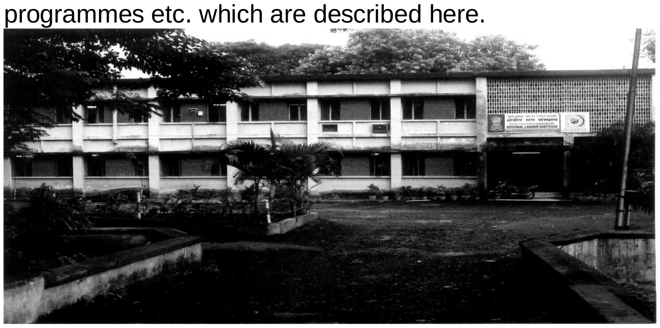
Dr.R.K.Elangovan, Director (Safety) delivered a talk on *Risk Management and Preliminary Hazard Analysis* in a two-day seminar on *Dispersion Modelling and Impact Assessment of Toxic and Flammable Releases* on June 24, 2010 for the benefit of eleven executives.

Shri A.Sreeramulu, Dy.Director (IH) delivered a talk on *Introduction to the Concept of Dispersion Modelling* in a two-day seminar on *Dispersion Modelling and Impact Assessment of Toxic and Flammable Releases* on June 24, 2010 for the benefit of eleven executives.

Shri N.Varadhararjan, Asst.Director (Safety) delivered a talk on *Heat Radiation from Pool Fires* in a two-day seminar on *Dispersion Modelling and Impact Assessment of Toxic and Flammable Releases* on June 24, 2010 for the benefit of eleven executives.

REGIONAL LABOUR INSTITUTE, KOLKATA

During the quarter from April 2010 to June 2010, Regional Labour Institute carried out studies and training programmes etc. which are described here.



Studies

Safety Audit at a Power & Steel Plant in Orissa (Das U. K., Chattopadhyay H. & Sengupta D. K., Industrial Safety Division, Regional Labour Institute, Kolkata)

Study of the Work Environment Monitoring at Electric Motors Manufacturing Industry in West Bengal (Banerjee S. N., & Sengupta, D. K., Industrial Hygiene Division, Regional Labour Institute, Kolkata)

Training programmes

The Insitute conducted a two-day training programme on *Industrial Safety* for the students of Post Diploma in Industrial Safety Course of Dr. Ambedkar Memorial Institute of Industrial Safety, Jagda, Rourkela, from April 20 to 21, 2010. Twenty seven students attended the programme.

The Institute conducted the AFIH course during the quarter. The course commenced from April 01, 2010 and successfully ended on June 30, 2010. Ten candidates attended the course.

Paper/Presentations/Talks

Dr. S. K. Haldar, Deputy Director (Medicine Division), delivered a talk on *Occupational Health Hazards in Construction Industries* in a programme organized by State Labour Institute, Kolkata on April 30, 2010. Twenty seven participants attended the programme.

Shri U. K. Das, Director (Safety), delivered a talk on *Safety in Construction Industries* in a programme organized by State Labour Institute, Kolkata on May 14, 2010. Twenty seven participants attended the programme.

QUOTABLE QUOTES

- A spill, a slip, a hospital trip.
- Open the Door to Safety: Awareness is the Key!
- Safety isn't expensive, it's priceless.

FILM ARCHIVE ON OCCUPATIONAL SAFETY, HEALTH & ENVIRONMENT AT CENTRAL LABOUR INSTITUTE, MUMBAI

The Government of India declared the National Policy on Safety, Health and Environment at Workplace on 28th February 2009. One of the goals of the National policy is to build and sustain preventive safety and health culture in the country in order to eliminate the hazards at workplace and to enhance the well being of employees in all the sectors of economic activities in our country. To attain this goal, one of the steps taken by Directorate General Factory Advice Service & Labour Institutes (DGFASLI) is to develop a **Film Archive on Occupational Safety, Health and Environment at Central Labour Institute in Mumbai**.

All the Film Producers, Organisations, Industries, Industrial Association, Trade unions, Professional bodies, Government and Non-Government organisations, Educational Institutes etc. are invited to enlist their films on Occupational Safety, Health & Environment (OSHE) in CD, DVD format etc. with the Film Archive for preparing a directory of OSHE films.

Interested Agencies/Individuals may please fill-up the proforma and send to:

The Director General,
DGFASLI
Central Labour Institute,
N.S.Mankiker Marg, Sion,
Mumbai 400022

or E-mail at editorindosh@gmail.com. The proforma may be downloaded from DGFASLI website at www.dgfasli.nic.in.

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Assessment of Compressed Breathing Air Quality at a Marine Training Institute in Maharashtra **(Metkari, M.A., Industrial Hygiene Division, Central Labour Institute, Mumbai)**

The Institute is engaged in imparting safety training to the seafarer personnel. Breathing air filled in cylinders is used by the trainees of the institute. The breathing air cylinders are filled with compressed air by using compressors. The study on evaluation level of contaminants like Oil mist, Carbon Monoxide, Carbon Di-oxide and Particulate Matter and parameters such as Oxygen, Humidity, Temperature and Odour in the compressed breathing air was carried out. These contaminants and the parameters in the compressed breathing air were meeting the standards as laid down by Bureau of Indian Standards, IS: 9623-2008 as well as standard CAN3-Z180.1-M85 of the Canadian Standard Association.

Safety Audit at a Chemical Plant in Maharashtra **(Gautam, S.S. and Sharma, S.C., Major Hazard & Chemical Safety Division, Central Labour Institute, Mumbai)**

The document is a report of safety audit carried out in a Production area, Bulk Storage area, Raw material & finish product area, Electrical section etc. The report reveals that the company has a safety policy. The safety committee is functioning well in the organisation. It has, however, been suggested that the worker members of the committee should be elected directly by the workers by holding the elections as provided in the rules. The main products of the plant are acrylamido methyl propane sulphonic acid and its sodium salt. The report lists about 155 suggestions including discharge of static electricity at different points.

HAZOP Study at a Chemical Plant in Maharashtra (Gautam, S.S. and Sharma, S.C., Major Hazard & Chemical Safety Division, Central Labour Institute, Mumbai)

The document is a report of HAZOP study carried out in the pilot plant of para armino phenol plant. The report reveals that the operating instruction should also include that the threads of hydrogen cylinder valve work in reverse directions. No port of the hydrogen manifold should be left free. Schedule for testing by explosive meter must be prepared and followed. Procedure for safe drainage of liquid should be defined and displayed. Only non-sparking tools should be used in the areas having hazard of flammable vapours. The methyl isobutyl ether tank should be provided with low level pump trip. History cards of all equipments should be maintained. Suitable firefighting facilities should be made available in the decanting station. Drivers and cleaners should not be allowed to handle the plant system. Tanks should be covered with sprinkler system operable from a remote place. The report lists about sixty six suggestions including provision of high level alarm and pump trip on high level

Safety Audit at a Hydro Development Unit in Uttarakhand **(Dwivedi, S.K., Srivastava, K., Safety Division, Regional Labour Institute, Kanpur)**

Safety audit was conducted for evaluation of safety and health status in the plant. It is a hydro-electric power manufacturing unit. The findings include the lapses in the Safety& Health policy, formation & working of Safety Committee, qualification of appointed safety officer & accident reporting system. Suitable suggestions in these regard have been made.

Assessment Study on Status of Safety, Health & Work Environment in Two Sugar Industries in Uttar Pradesh **(Brij Mohan, Bhattacharya, C., & Srivastava, K., Industrial Hygiene Division, Medical Division and Safety Division, Regional Labour Institute, Kanpur)**

The study was multidisciplinary in nature and therefore a team of experts from Safety, Occupational Hygiene and Medical disciplines was involved in the above studies. The workers were exposed to different physical, chemical electrical and mechanical hazards in the above factories and therefore monitoring of different physical, chemical, electrical and mechanical contaminants such as bagasse dust, lime dust, sugar dust, sulphur dioxide, noise, heat etc., was carried out in different plant areas. Thorough visits were made to different plant areas of the factories to evaluate measures taken by the factory to control chemical, physical, electrical and mechanical hazards. Safety management aspects were also reviewed during the study. Medical examinations of the workers in both the units were carried out by random selection from workplaces to determine the effects of exposure to different physical and chemical agents. During medical monitoring general physical examination, ECG and audiometric tests were carried out by the medical team to study the prevalence of occupational diseases among them. About seventy workers were medically examined in both the sugar industries. Based on the studies in these units project guidelines on safety and health for sugar mills will be prepared.

Regional Project on Prioritization of Major Accident Hazard Factories in Uttarakhand **(Gautam, S.S., MH&CS Division, Central Labour Institute, Mumbai and Brij Mohan, Industrial Hygiene Division, Regional Labour Institute, Kanpur)**

Regional project on prioritization of major accident hazard factories of the state Uttarakhand was conducted with an aim to prioritize MAH installations & define their hazards categories. This was done in collaboration with Deptt. of Labour, Directorate of Factories & Boiler, Uttarakhand. In the findings, it was indicated that 22 units were falling in category-1, 3 units were falling in category-2 & no factory in category-3. There were LPG, Propane, extremely/ flammable liquids, Chlorine, Sulphur-di- Oxide, Liquefied Oxygen, Ethylene oxide & Sodium chloride as main MAH installations. Recommendations were given to improve OSH management system & preventive control measures for different categories of the installations.

Safety Audit at a Car Manufacturing Plant in Karnataka (Elangovan, R.K., Industrial Safety Division, Regional Labour Institute, Chennai)

A safety audit was conducted at a car manufacturing plant located at Bangalore during the first week of June, 2010. The plant has four manufacturing shops such as Press Shop, Welding Shop, Paint Shop and Assembly Shop. The audit was conducted as per the BIS 14489:1998 standard codes of practices on Occupational Safety and

Health (OSH) audit systems. The Safety Audit covered various management and technical elements of occupational safety and health systems in the plant. All the OSH elements of the management systems listed in the standard were checked during the audit. The major recommendations of the audit are LPG Safety, Transport Safety inside the factory premises, fume control measures, electrical safety, on-site emergency planning, effective mock drills, static electric safety, lightning protection and development and implementation of SOPs and SMPs inside the factory.

Safety Audit at a Power & Steel Plant in Orissa **(Das U. K., Chattopadhyay H & Sengupta D. K. Industrial Safety Division, Regional Labour Institute, Kolkata)**

Safety Audit was conducted for evaluation of safety and health status in the Power & Steel Plant. The audit was conducted as per the BIS 14489:1998 standard codes of practices on Occupational Safety & Health (OSH) audit systems. The audit covered various management and technical elements of OSH systems which were checked during the field visit. The important recommendations of the audits were creation of standard operating and maintenance procedures, safety inspection, fire protection and prevention, PPE, on-site emergency preparedness plan, etc.

Study of the Work Environment Monitoring at Electric Motors Manufacturing Industry in West Bengal **(Banerjee S. N., & Sengupta, D. K., Industrial Hygiene Division, Regional Labour Institute, Kolkata)**

The study was carried out for the examination of prevailing working condition with respect to air-borne levels of various chemicals in the Pre-treatment Shop and heat & ventilation in different locations in the plant for the improvement of their working condition. The study has revealed that air-borne levels of caustic, sulphuric acid, phosphoric acid and chromic acid in Pre-treatment Shop found trace, 0.5-1.70mg/m3, 0.076-0.093mg/m3, 0.0183-0.0287mg/m3(as chromium VI) respectively. The air-borne levels of sulphuric acid were below threshold limit value in Pre-treatment Shop except in one location where the air-borne level of sulphuric acid was found more than TLV. In case of other chemicals, their air-borne levels were found well below to their respective threshold limit values in Pre-treatment. In most of the areas, the level of noise measured was more than permissible value of 90dBA for eight hours. Noise levels measured in Die-casting ranges from 88.3 to 93 dBA; in Press Shop, it ranges from 101 to 116.7; in Generator Room, it was from 95.8 to 100.7dBA near 310KVA, 96.5 to 100 dBA near 200KVA & 97.5 to 97.9 dBA near 160KVA and in Rotar End Brazing, the measured noise was in between 92.4 to 96.2. Levels of heat in Die-casting, Hand Strator Heating Oven, Varnish Treatment & pre-treatment and Rotar End Ring Brazing were found within Comfortable zone. The suction velocities measured in front of Paint Booth No.1,2,3,4 & 5 were 3.5-4.5m/s, 1.5-4.0m/s, 1.5-3.5m/s, 3.5-5.0m/s and 1.5-3.5m/s respectively. Action to be taken for the improvement in the working condition has been suggested starting from Engineering Control to Administrative Controls. Installation of suitable barrier, use of ear protective equipment, etc. have been proposed for the reduction of noise exposure. Detailed ventilation study, Personal protective equipment, etc have been recommended for the improvement of working condition.

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CIS: INTERNATIONAL OCCUPATIONAL SAFETY AND HEALTH INFORMATION CENTRE

CIS (from the French name, Centre International d'information dr 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 Centres. Central Labour Institute, Mumbai has been designated as the CIS National Centres of India. CIS can offer you rapid access to comprehensive information on occupational safety and health through its abstracts on latest OSH publications, the CIS Thesaurus and ILO Bulletin 'Safety and health at Work'.

MATERIAL SAFETY DATA SHEET FOR NAPHTHA

The Library & Information Centre of Central Labour Institute has unique collection of Material Safety Data Sheet of about 1,20,000 chemicals/materials taken from Canadian Centre for Occupational Health & Safety. MSDS provides extensive coverage over safety perspective with detailed evaluation of health, fire and reactivity hazards. It also provides precaution as well as recommendation on handling, storage, personal protective equipment, accidental release etc. A brief Material Safety Data Sheet on few points for Naphtha is given below.

PRODUCT NAME: NAPHTHA
Product Description: Aliphatic Hydrocarbon

HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines
Potential Physical / Chemical Effects: Combustible. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an incendiary electrical discharge.
Potential Health Effects: If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and lungs.Repeated exposure may cause skin dryness or cracking. May cause central nervous system depression.
Environmental Hazards: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

FIRST AID MEASURES

Inhalation: Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.
Skin Contact: Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.
Eye Contact: Flush thoroughly with water. If irritation occurs, get medical assistance.
Ingestion: Seek immediate medical attention. Do not induce vomiting.
Note To Physician: If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

FIRE FIGHTING

Fire Fighting Instructions: Flammable. Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.
Unusual Fire Hazards: Vapors are flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment
Hazardous Combustion Products: Smoke, Fume, Incomplete combustion products, Oxides of carbon.

ACCIDENTAL RELEASE MEASURES

Notification Procedures: In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks.
Protective Measures: Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces. Recover by pumping or with suitable absorbent.
Water Spill: Stop leak if you can do it without risk. Eliminate sources of ignition. If the Flash Point exceeds the Ambient Temperature by 10 degrees C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants. Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

HANDLING AND STORAGE

Handling: Avoid contact with skin. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Use only with adequate ventilation. Use proper bonding and/or grounding procedures. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).
Static Accumulator: This material is a static accumulator.
Storage: Keep container closed. Handle containers with care. Open slowly in order to control possible pressure

release. Store in a cool, well-ventilated area. Storage containers should be grounded and bonded. Drums must be grounded and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

Suitable Containers/Packing: Tank Cars; Tank Trucks; Barges; Drums

Suitable Materials and Coatings: Carbon Steel; Stainless Steel; Cast Iron; Copper Bronze; Inorganic Zinc Coatings; Polyamide Epoxy; Polyethylene

Unsuitable Materials and Coatings: Butyl Rubber; Natural Rubber

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider: Adequate ventilation should be provided so that exposure limits are not exceeded. Use explosionproof ventilation equipment.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable.

Types of respirators to be considered for this material include: Half-face filter respirator for high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly affect glove durability; inspect and replace worn or damaged gloves.

The types of gloves to be considered for this material include: If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include: If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping

ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

Ecotoxicity: Material -- Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

Mobility: Material -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation: Material -- Expected to be readily biodegradable.

Hydrolysis: Material -- Transformation due to hydrolysis not expected to be significant.

Photolysis: Material -- Transformation due to photolysis not expected to be significant.

Atmospheric Oxidation: Material -- Expected to degrade rapidly in air.

NOTE

The above details constitute part information of MSDS taken from Canadian Centre for Occupational Health and Safety. For complete MSDS write to MIS division, Central Labour Institute, Sion, Mumbai- 400 022. MSDS on about 1,20,000 chemicals/materials are available with Central Labour Institute. Computer printout will be supplied on nominal charge.

Ph. No.:- 022-24092203, Fax. No.:- 022-24071986

INDOSHNET

Ministry of Labour & Employment, Government of India, is developing a National Network on Occupational Safety and Health information system known as INDOSHNET. Directorate General Factory Advice Service & Labour Institutes (DGFASLI), an attached office of the Ministry of Labour will act as a facilitator of the network system. The objective of the network is reinforcement and sharing of national Occupational Safety and Health (OS&H) informationon 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 wirte proforma of organizational orpfile to Director General, DGFASLI, Central Labour Institute, N.S.Mankiker Marg, Sion, Mumbai 400022.

Note: Those who have responded to our earlier communication and sent organisation profile in the prescribed format need not write again.

TRAINING CALENDAR FOR THE YEAR 2010: DGFASLI

CENTRAL LABOUR INSTITUTE
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Telephone: 91-22-24092203, Fax: 91-22-24071986/24033995 Visit us at: www.dgfasli.nic.in

S.No	Title of the Programme	Period	Coordinator (Technical)
1.	Collaborative Training Programme with NSC-Maharashtra Chapter on Industrial Safety	April 06-08	B.L.Bairwa
2.	Workshop on Hazards & Operability (HAZOP) Study	April 07-09	S.S.Gautam
3.	On the Job Counseling Skills	April 21-23	P.K. Mohanty
4.	Selection & Quality Assurance for Effective Use of PPE	April 28-30	M.K.Mandre
5.	Team - building for Health, Safety & Welfare at Work	May 12-14	N.K.Rustagi
6.	Productivity & Quality through Effective Employee Participation	May 18-20	R.N.Meena
7.	Workshop on Safe Handling of Chemicals for Safety Committee Members	May 19-21	S.S.Gautam
8.	Collaborative Training Programme with NSC-Maharashtra Chapter on Industrial Safety	May 24-26	S.Bharathi/ B.L.Bairwa
9.	Motivation for Safety, Health & Productivity	May 24-26	P.K.Mohanty
10.	Workshop on Industrial Ventilation	June 07-09	S.S.Gautam
11.	Workshop on Occupational Safety, Health & Environment for Safety Professionals – Innovation & Challenges	June 09-11	S.Bharathi
12.	Effective Supervision for Results	June 21-23	N.K.Rustagi
13.	Advanced Diploma in Industrial Safety (ADIS) 2010-11: First Teaching Term	July 01–2nd Week of November	S.Bharathi/ B.L.Bairwa
14.	Ergonomics-A tool for improving Safety, Health & Productivity at Ship Building Works	July 13-15	D.R.Krishna
15.	Occupational Safety & Health Management in Process Industries	July 21-23	S.C.Sharma
16.	Refresher Course on Occupational Health for Plant Medical Officers	August 09-13	Dr. S.S. Waghe
17.	Workshop on Industrial Noise	August 18-20	S.Chandra
18.	Making Safety Committee more Effective	August 25-27	P.K.Mohanty
19.	One Month Specialized Certificate Course in Safety and Health for Supervisory Personnel Engaged in Hazardous Process Industries	September 01-September 30	Dr.M.Rajaram
20.	Basic Course for Inspector of Factories	September 06-24	B.L.Bairwa
21.	Training Methodology for Trainers	September 07-09	N.K.Rustagi
22.	Training Workshop on Hazard & Operability (HAZOP) Studies	September 22-24	S.C.Sharma
23.	Ergonomics- A tool for improving services in Hotels, Malls and Hospitals	September 28-30	D.R.Krishna
24.	Training Programme on Occupational Health Nursing for Nurses & Paramedicals	October 04-08	Dr. S.S. Waghe
25.	Monitoring of Work Environment in Industries	October 06-08	M.K.Mandre
26.	Ergonomics for Machine operators/ Service/Maintenance Personnel	October 19-21	D.R.Krishna
27.	Handling Problem Behaviour of Employees	November 10-12	P.K.Mohanty
28.	Refresher Course for Inspector of Factories	November 15-26	B.L.Bairwa
29.	Productivity & Quality through Effective Employee Participation	November 23-25	R.N.Meena
30.	Safety in Storage, Handling & Management of Hazardous Substances in Process Industries	November 24-26	S.C.Sharma
31.	Advanced Diploma in Industrial Safety (ADIS) 2010-11: Continued	December 01, 2010 - April 30, 2011	B.L.Bairwa
32.	Evaluation of Heat Stress to improve Productivity	December 07-09	D.R.Krishna
33.	Safety, Health and Environment Management in Chemical Industry	December 08-10	M.A.Metkari
34.	OSH-MS	December 14-16	Dr.M.Rajaram
35.	Impact of Environmental Pollutants & their Control at Work Place	December 20-22	S.Chandra
36.	Associate Fellow of Industrial Health (AFIH)	Dec.2010 - Feb 2011	Dr. P. P.Lanjewar

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S.No	Title of the Programme	Period	Coordinator
1.	Training Programme on Prevention & Control of Fire in Industry	April 13-15	Dr. Brij Mohan
2.	Training Programme on Safety & Health in Sugar Industry	April 27-29	Dr. Brij Mohan
3.	Training Programme on Chemical Safety for Safety Committee Members	July 06-09	Dr. Brij Mohan
4.	Post Diploma Course on Industrial Safety 2010-2011	July 2010 - March	S.K.Dwivedi

		2011	
5.	Training Programme On Testing & Examination of Lifting Machines & Pressure Vessels	August 16-20	G.S.Pandey
6.	Training Programme on Safety & Law	September 06-08	A.K.Chakraborty
7.	Orientation Programme on Occupational Health for Para-Medical Staff	September 13-15	Dr.C.Bhattacharya
8.	Seminar on "Emerging Issues on Safety and Health Management"	September 22	Dr. Brij Mohan
9.	Workshop on Monitoring of Work Environment and its Control	October 06-08	Dr. Brij Mohan
10.	One Month Certificate Course on Safety & Health	November 01- 30	A.K.Chakraborty
11.	Training Programme on Process Safety Management for Inspectors of Factories	December 06-10	Dr. Brij Mohan
12.	Workshop on Safety Audit	December 13-15	A.K.Chakraborty

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S.No	Title of the Programme	Period	Coordinator
1.	Diploma in Industrial Safety	July 2010 – April 2011	C.M.Nigli
2.	Occupational Safety and Health in Construction Industries	July 27-28	C.M.Nigli
3.	Safety Audit	August 24-26	C.M.Nigli
4.	Major Accident Hazard Control in Industries for Inspectors of Factories	September 21-24	A.Sreeramulu
5.	Management of Hazardous Substances in Chemical Industries	November 09-12	A.Sreeramulu
6.	Occupational Safety and Health in Construction Industries	December 07-08	K.Balasubramanian

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S.No	Title of the Programme	Period	Coordinator
1.	Safety & Health Awareness programme for Members of Safety Committee	April 19- 23	H. Chattopadhyay
2.	Safety in Construction Industry	May 03- 07	U.K.Das
3.	Fire Safety & its Management	June 21-28	U.K.Das
4.	One year Diploma in Safety Engineering Course	July 14	H. Chattopadhyay
5.	Faculty Development Programme on "Occupational Safety & Health"	July 26- 30	H. Chattopadhyay
6.	Identification, Evaluation and Control of Hazards in Industries.	August 16-20	Dr.S.N.Banerjee
7.	Training Programme on Chemical Safety	September 06-10	U.K.Das
8.	Safety in Construction Industries	Sept 27 - Oct 01	U.K.Das
9.	Occupational Health and Environmental Medicine for Medical & Non-Medical Executives of the Industries	October 25-29	Dr. S.K.Haldar
10.	Workers Development Programme	November 10- 11	Dr.S.N.Banerjee
11.	One Month Specialized Certificate Course in Safety & Health for Supervisory Personnel working in Hazard Industries	November 15 - December 14	H. Chattopadhyay
12.	Associate Fellow of Industrial Health	Dec 01, 2010 – Feb 30, 2011	Dr. S.K.Haldar

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S.No	Title of the Programme	Period	Coordinator
1.	Management of Safety Health and Environment at Workplace	April 21- 23	Rajeev Shukla
2.	Environmental hazards and their Management at work place	May 24- 26	M.R.Rajput
3.	Participative Approach for Safety & Health Management	June 23-25	Dr. Avneesh Singh
4.	Chemical Hazards and their Management at Workplace.	July 21-23	M.R.Rajput
5.	One Year Post Diploma in Industrial Safety (PDIS)	July 2010 – April 2011	Dr. Avneesh Singh
6.	Behavioral Approach for Positive Safety Culture	August 18-20	Dr. Avneesh Singh
7.	Management of Safety Health and Environment at Workplace	September 6-7	Rajeev Shukla
8.	Physical Hazards and their Management at workplace	October 20-22	S.M.Chaugule
9.	Occupational Safety and Health in Construction Industry	November 24-26	Rajeev Shukla

- Training programme brochures will be mailed sufficiently in advance, specifying the dates of commencement of course, its venue etc., to the organisations as per mailing list available.
- Course-coordinator may be contacted for details such as training programme dates, venue, programme contents, level of participants, course fee and its payment etc.
- Admission to the course will be restricted to 20 participants on First-Come-First-Served basis. Participants are not allowed to attend the training course without written confirmation by the course-coordinator.
- Limited Hostel Accomodation on sharing and chargeable basis will be available on 'First-Come-First-Served' basis.