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FROM THE DESK

The Audit conducted by an independent agency, preferably an outside agency, brings out the state of affairs in the area of activities being covered by the audit so that the management comes to know the effectiveness of its programme for achieving the target and also the need, if there is any, to improve upon the existing programme. A safety audit or an environmental audit does the same thing.

This organization conducts safety audits and audit of environment at workplace, when requested by the factories. The cover feature of this issue is an abstract of a similar exercise done in the Thermal Power Stations located in the western region of India. Although, the scope of audit was somewhat limited, the report definitely brought out the areas of strength and weaknesses in the management system in controlling the environment at workplace. Although, the findings are on the basis of the audit conducted at the thermal power station, the elements covered and the findings can be used in other factories as well. I strongly feel that the factories will realize the importance of conducting similar audits and find out what has gone wrong or may go wrong in the areas of safety and environment control.

This organization will be keen to give help in this regard.

S.K.SAXENA
EDITOR-IN-CHIEF

ENVIRONMENTAL AUDIT FOR ESTABLISHING EMS IN THERMAL POWER STATION

S. P. RANA

INTRODUCTION

With a view to establish Environment Management System (EMS) in thermal power stations, Environmental Audits were carried out by the author in five thermal power stations located in the western region of India with the objective to carry out a systematic documented evaluation to establish whether or not the organizations' EMS and activities conform to the requirement of environmental management standard, ISO-14001 and to determine whether the EMS has been properly implemented and maintained. The objective was also to identify areas of potential improvement in the organizations' EMS and to assess the ability of management review process to ensure the continuing suitability and effectiveness of the EMS. It was also ensured whether the environmental management standard fully satisfied the legal requirements and those of company's environmental policy, objectives and programmes. Ultimately, the guidelines were provided in the form of recommendations for improving the existing standard of environmental performance of the company.

SCOPE

The scope of environmental audits was limited to all the environmental aspects pertaining to the organization's activities, products and services that can interact with the environment. Elements covered were; Environment Policy, Water Management, Water Analysis, Organization, Environment Aspects, Objectives & Targets, Environmental Management Programmes (EMPs), Tree Plantation, Statutory requirements, Structure & Responsibility,

Training, Communication, EMS – Documentation, Document Control,

Operation Control, Emergency Planning, Effluent Treatment/Waste Disposal, Ash Disposal, Monitoring & Measurement, Audit and Management Review.

METHODOLOGY

Methodology applied for the study was EMS Audit as per the IS / ISO 14011. An audit team was formed in which the author was one of the auditors. A questionnaire on EMS - audit was sent to the management for furnishing information. Field visits to different Thermal Power Stations(TPS) were undertaken. During the field visits, discussions were held with the management and plant personnel. Few operators were also interviewed to know the level of awareness on environmental aspects/issues. Site inspections to different units were also carried out with critical observations to identify various environmental hazards and to assess the potentials of the same. Documents pertaining to EMS viz. environmental policy, statutory requirements, monitoring and measuring procedures, water management, air emissions, safe operating procedures, emergency preparedness, maintenance records, etc. were examined during the audit.

OBSERVATIONS

Environment policy has been prepared by all the TPS but addressing of local objectives and targets were not given. The environmental aspects were not identified by most of the stations. Most of the plants comply with statutory requirements but in some cases it was found that hazardous waste was not identified. The local objective

and targets were not fixed. Some of the units have made action plan for the augmentation of their part of the unit. Training needs were identified but those were mostly related to operational procedures. Mainly operational control procedures were documented but environmental related documents were not given due attention. Ash was disposed of in ash bunds but utilization is still a great concern. Monitoring and measuring of environment related parameters were given due care. In some of the units, internal audits were carried out.

RECOMMENDATIONS

The author has summarized the common recommendations of some of the predominant elements which are primarily responsible for the effective establishment and implementation of EMS in the organization:

Environment Policy: Environment policy should address all the objectives and targets based on environmental aspects. The policy should be displayed in prominent places inside the plant. It should be circulated among the employees and be made available to the public.

Organizational Structure: The Environment division/cell should make/modify the year planner to incorporate all the activities related to the EMS like formulating different procedures, planning, inspection and auditing, etc. to improve the environmental performance.

Environment Aspect: The identification of potential environmental aspects by making use of some of the available techniques has to be carried out. Some of the techniques used for this purpose are; Preliminary Environmental Review/Audit/Inspection, Professional Judgment, Site Survey, Historical Review, Task Analysis, Accident / Incident Reports, Rating Systems, HAZOP Study, Life Cycle Assessment, etc. Each department/division may be asked to identify potential environmental aspects in

their areas and accordingly registers of environmental aspects should be maintained and updated. Procedure for identification of environmental aspects and significant environmental aspects should be made by the environmental division/cell and distributed to all the departments/divisions. For evaluation of all the environmental aspects for their significance, different approaches may be used to decide the likelihood and consequences of a particular effect. Any of the methods available like Ranking System, Use of Questionnaire, and Scoring System may be used. A method called SSPD (Scale, Severity, Probability, Duration) approach is quite popular and effective for getting the significant environmental aspects. The procedure for evaluating the above has to be prepared and circulated to each department/division giving the scope, responsibilities and method of evaluation in details.

Statutory Requirements: The management has to make procedure for identification of statutory requirements. A register mentioning all the statutory requirements and responsibility to renew/maintain them should be made and maintained.

Objectives and Targets: The objectives and targets should be based on significant environmental aspects, statutory and other requirements of the plant. These should be consistent with the environmental policy including commitment to prevention of pollution. Technological options, financial, operational and other business requirements should be taken into consideration while establishing objective & targets. The objectives should be documented and need to be reviewed fairly regularly to assess their relevance.

Environment Management Programme: The management has to make the Environment management programme covering all the objectives set out by it detailing actions to be taken to achieve the objective and targets and accordingly Environmental Manual may be prepared covering all the EMPs. EMP

should be amended as soon as new activities/products/services are incorporated or any new modification/new project is introduced, and it should be ensured that the environmental management is applied to above areas.

Structure and Responsibility: An organized management structure is required to establish an EMS and to ensure effective implementation of the company's environmental policy. The roles, responsibilities and authorities must be clearly defined for all the employees whose work is involved in EMS. The management should identify/appoint a Management Representative (MR) who will ensure the establishment, implementation and maintenance of EMS and communicate the performance of the system to the top management for its review.

Training: The training need of all the personnel should be identified by the company whose work may create a significant impact upon the environment. Chemical Safety, EMS, auditing, Hazard Assessment, Statutory compliance, etc are some of the areas for training need identification. The company should establish and maintain procedures to make its employees aware of the relevant functions like the importance of conformance with respect to the environment policy and different procedures as per the requirement of environmental management systems. The persons should be aware of significant environment impact and their roles and responsibilities in achieving the objectives and targets laid down in the environment policy.

Communication: There should be established and maintained procedures for internal communication between various levels and functions of organization. There should be a procedure for receiving, documenting and responding to relevant communication from external parties like nearby habitat, customers, visitors, etc.

EMS Documentation: The management should describe all the core elements of environment management system and their interaction with one another. It is required to prepare the procedural manual and work instruction for EMS.

Document Control: The management should establish and maintain standard procedures for controlling of all the documents to ensure that:

- a. All the documents are easily located and reviewed/ revised periodically as and when required by the authorized person.
- b. Current relevant documents should be available at all locations where operations essential to the effective functioning of EMS are performed.
- c. Discarded documents to be removed from the points of issue/ use.
- d. The documents retained and preserved for legal requirements should be suitably identified.

Operational Control: The management has to identify all the operations and activities for all the identified significant environment aspects. After identification of these activities, proper planning is to be done for these activities so that an established and maintained documented procedure could be laid down to ensure that any deviation from the operations, activities is very well taken care of under specified conditions. Accordingly planning should be done for the identified significant environment aspects of goods and services used by the company and communicate relevant procedures and requirements to the suppliers and contractors under specified conditions.

Emergency Preparedness & Response: Training is required to know the emergency plan and handle the emergency efficiently. The environmental issues may be incorporated in the existing On-Site Emergency Plan- an integrated approach. A small booklet consisting of summary of On-Site Emergency Plan may be prepared and

distributed to create awareness amongst the employees.

Effluent Treatment/Waste Disposal: There should be procedures for analysis and records of these should be maintained properly. The management should identify the hazardous/non-hazardous waste generated in the different operations and accordingly select the site for its safe disposal.

Water Management: It is recommended to do periodic checking of the water consumption by ultrasonic flow meter where the calculation is taken on the basis of running hrs. Periodicity of calibration of flow meter is to be defined and implemented.

Ash Disposal: The management should explore the possibility of fixing the time bound target for ash utilization. Efforts should be made to utilize/recycle entire water collected from the ash bund.

Monitoring and Measuring Equipment: All the monitoring and measuring procedures should be established, documented and made available to the concerned persons. There should be a procedure for calibration of all critical instruments/equipments and schedule for this should be maintained. Records of calibration of all the monitoring and measuring instruments/equipments should be retained.

Audit: There should be Audit Programme and Procedures covering activities and areas to be considered, frequency of audit, communication of audit results, etc. The audit objective, scope, methodology, audit plan, roles, responsibilities and activities of auditors and auditees should be clearly defined. Internal audit should be carried out periodically as to be specified in audit programme. External audit should be carried out to assess and evaluate the environmental management system and its effectiveness.

Management Review: In order to have continual improvement in environmental performance of the company, it is recommended that a committee consisting of top management personnel should be formed and entrusted to review the:

- a) Objectives, targets and performance
- b) Implementation of EMS Audit 000000findings
- c) Effectiveness of EMS
- d) Suitability of Policy and the need for changes in light of legislative changes, changes in products, activities or services, technological changes.

The frequency of management committee for reviewing the above should be defined and the observations, conclusions and recommendations of management review should be recorded.

CONCLUSION

All the thermal power stations were having some documentation and to some extent EMS was in place. Certain elements were not given due importance and a haphazard approach was adopted in maintaining the system. In the absence of structured approach, the system was found to be somewhat ineffective. It is an established fact that unless the implementation of EMS in an organization reduces the negative impacts on the environment of its business activities, it will not be of much use. A proper environmental management system based on ISO 14001 installs a management system that will generate significant advantage over a period of time. Such EMS offers a great opportunity to adopt the best practices for the industry and most likely will pay off in terms of reduced risk, emissions control and improve employee morale.

References:

1. Reports on Environment, Health and Safety Audit of different Thermal Power Stations conducted by Central Labour Institute, Mumbai.
2. Indian Standard - Environmental Management Systems - Specification with Guidance for use (IS/ISO - 14001 - 1996).
3. Indian Standard - Guidelines for Environmental Auditing – Audit Procedures – Auditing of Environmental Management Systems (IS/ISO - 14011 - 1996).
4. The Environment (Protection) Act, 1986 and Rules there under.

Shri S. P. Rana
Assistant Director (Safety)
Central Labour Institute, DGFASLI
Sion, Mumbai - 400022

CREATING AND SUSTAINING A SAFETY AND HEALTH CULTURE

HERMAN VAN DER LAAN

..... Is the crux of the World Day for Safety and Health at Work this year, and for a good cause to! Each day, an average of 5,000 men and women die as a result of work-related accidents and diseases, according to ILO estimates. Across the globe, there are some 270 million occupational accidents and 160 million diseases each year.

India has not been spared its share of tragedies because of such accidents and diseases. 2004 in fact is the twentieth anniversary of one of the worst chemical disasters ever. In a gas leak from a pesticides factory in Bhopal, 2,500 people were killed and over 200,000 injured in the space of a few hours. Not only were the workers at the factory affected, so were their families, their neighbours and whole communities. This reminds us of the imperative to create a safety culture in which governments, employers and workers play their role in order to prevent such tragedies from happening again.

The ILO was founded to ensure everyone the right to earn a living in freedom, dignity and security, in short "Decent Work". The ILO has never accepted the proposition that injury and disease "go with the job". Safe and healthy working environment is part of the Decent Work concept. In the face of globalization, the new challenges are to ensure that increasing numbers of working people enjoy such safe and healthy working conditions.

Job related accidents and diseases don't just "happen". They are caused. For example, cancer which accounts for a third of all work related death, can be caused by asbestos, other carcinogenic

dust and chemicals and ionizing radiation. Accidents can be caused by improper guarding, hazardous work methods, etc.

In reality, causes can be addressed and suffering can be prevented. Fortunately, in a growing number of workplaces, workers, employers and governments are demonstrating through cooperation and dialogue that it is possible to create safer, healthier workplaces –and at the same time to improve productivity and bottom-line results. This is the emerging phenomenon of promoting a "safety and health culture". Undoubtedly, a strong safety and health culture in all enterprises is a key step towards both preventing occupational deaths and diseases and tackling related effects of globalization.

The creating and sustaining of such culture requires the active involvement and cooperation of all stakeholders – Government, employers, workers, research and training institutes, safety councils, management development centers, etc., which have through the years been successful in placing occupational safety and health on the agenda in India.

Additional to the overarching theme, the World Day for Safety and Health at Work 2004 focuses on three of the many areas of concern, which the ILO addresses – chemical hazards, workplace violence and occupational respiratory diseases.

- Chemical hazards represent a serious danger of worker. Information about proper use, handling and storage of hazardous chemicals is a key

- factor in preventing accidents and illnesses. The ILO recognizes this and has acted to provide easily accessible sources of information to protect workers around the world, such as a globally uniform system of labelling hazardous materials.
- Workplace violence, while not a new phenomenon, has only recently been recognized as a potential danger to workers' health and to productivity. The ILO has adopted a Code of Practice on workplace violence, providing a tool for governments, employers and workers to prevent such violence.
 - Hundreds of thousands of deaths from lung disease caused by exposure to dusts containing asbestos, silica and other dangerous substances are all the more tragic because they are preventable. Appropriate action taken by governments, employers and workers can make a notable difference. The ILO provides both a policy framework for action in this area as well as practical information and training.

More information on the themes of the World Day for Safety and Health at Work 2004 can be found at the website www.ilo.org/english/protection/safework

Mr. Herman van der Lann
Director, ILO Subregional Office
for South Asia and
ILO Representative in India

STUDY OF DUST LEVELS IN A CLOTH CUTTING SHOP

This study was carried out by Regional Labour Institute, Chennai in a cloth cutting shop engaged in the production of clothing for Defence and Para Military Forces.

OBJECTIVE

The study was conducted with the objective to assess the airborne dust levels in work environment and to suggest remedial measures wherever necessary to improve the work environment.

FINDINGS

The average concentration of airborne dust near band knife cutting machine and bundling operation while cutting woolen clothes in cloth cutting shop were found to be 3.1 mg/m^3 and 2.2 mg/m^3 respectively. Whereas the concentration while cutting the cotton cloth, were found as 3.2 mg/m^3 and 2.6 mg/m^3 respectively. The dust concentration in general environment in the shop was found as 0.5 mg/m^3 .

RECOMMENDATIONS

Certain remedial measures were suggested to improve the environmental conditions which included provision of dust extraction system with the band knife cutting machine, the exhaust fans in the shop should be kept in running condition, provision of good quality disposable respirators to the workers engaged in cutting and bundling operations, effective implementation among the workers engaged in cutting shop, replacement of existing vinyl flooring in the cutting shop with a floor of smooth and even surface, floor sweeping in cutting shop should be performed before commencing the shift/day work and wet mopping should be introduced in place of broom sweeping for floor cleaning, etc.

ENVIRONMENTAL STUDY IN A CHEMICAL COMPANY

This consultancy study was carried out by Regional Labour Institute, Chennai in a chemical company engaged in the production of antibiotics.

OBJECTIVE

This study was conducted with the objective to assess the airborne levels of contaminants e.g. solvent vapours, pharma dust, ammonia, HCL vapours and measure noise levels at various places and to suggest remedial measures wherever necessary to improve the work environment.

FINDINGS & RECOMMENDATIONS

Pharma dust (TC Acid, 7-ADCA, Cephalexin) at various places e.g. vacuum tray dryer, rotary vacuum dryer etc. was found to exceed the PLE i. e. 5 mg/m^3 . Remedial measures were suggested to improve the existing exhaust ventilation system, periodic checking of the efficiency of the exhaust and effective implementation of dust mask among the workers engaged in all the powder processing areas.

The concentration of ammonia gas near incinerator scrubber sump in ecology plant was found to range from 10 to 50 ppm which exceeded the PLE-STEL of ammonia. Permanent closing of flue gas outlet on the ground floor was suggested. Concentration of ammonia near ID fan of incinerator also exceeded the PLE. It was suggested that the open end of the pipe line carrying flue gases should be properly connected to the blower to avoid any release of waste gases into atmosphere.

Highly corrosive liquid TMCS is handled in raw material storage area. Though the concentration of HCl vapour near pumping station while pumping of liquid TMCS was found well within the PLE, keeping in view the emission of highly corrosive HCl vapours and the hazards of liquid TMCS, it was suggested that the pumping station should be properly enclosed with an acid

resistant transparent PVC sheet instead of the existing opaque plastic plates, besides provision of acid resistant flooring in the room and emergency shower with eye wash fountain for use in emergency was also suggested.

On 17.9.2003, during the 1st shift, trailers belonging to a C&F were parked in an open yard in a Port. One of the trailers was a 40ft. empty trailer which turned to the right and fell into the dock basin. The Port Trust drivers carried out a search in the dock basin and retrieved one body. The body was recognized as that of the cleaner who was deployed for the above trailer.

Investigation into the accident revealed that it had taken place due to fall of the trailer into the dock basin. The C&F agents were advised to provide key starters on all the transport equipment and the same should not be bi-passed. The C&F agent were to instruct their cleaners not to drive transport equipment unauthorisedly in the Port.

On 3.1.2003, during the night shift, a winch operator was operating crane for loading thermal coal into a hatch in a Port. Suddenly the jib of the crane fell down snapping the hoist rope. The snapped hoist rope hit the crane cabin damaging the front and side glasses which resulted in the winch driver falling through it. He received severe injuries and succumbed to it in the hospital.

Investigation into the accident revealed that it had taken place due to injuries received by the winch operator as he fell through the cabin wind shield due to snapping of the hoist rope. The fall of the jib was due to the non maintenance of the hydraulic system breaching Regulation 41 of the Dock Workers(Safety, Health and Welfare) Regulations, 1990. The Owner of the vessel was warned for contravention of the Regulation 41 and was also advised to provide seat belts .

On 7.11.2003, a worker was employed for unloading of wheat bags from a railway wagon in a Port. The worker was struck by a trailer due to which the worker suffered severe head injuries and succumbed to the injuries on the spot.

The investigation in to the accident revealed that it had taken place due to improper supervision breaching Regulation 117 read with Regulation 7(5). Further the driver of the truck did not operate the trailer with the assistance of a cleaner breaching Regulation 57(8) (b) read with Regulation 7(5). The supervisor, driver and co-worker were warned for breach of Regulations 117 & 58(8) (b) read with Regulation 7(5) of the Dock Workers(Safety, Health and Welfare) Regulations, 1990.

On 11.11.2003, dumpers were engaged for transport of cock at a Port from a vessel to a plot. A supervisor of a stevedoring firm was coming from duty in his bicycle when loaded dumpers dashed him from behind and crushed him to death.

The investigation in to the accident revealed that it had taken place due to rash and reckless driving by the dumper driver. The driver of the dumper was warned for his reckless and unsafe driving. Further the port authorities were advised to evolve a mechanism to check the speed of the trucks/ dumpers and other transport equipments to prevent such accidents in future.

On 28.11.2003, in the second shift mazdoors were engaged for unloading of iron-ore from trucks in a Port. After unloading one forth of the cargo, the driver moved the truck forward on his own and one of the mazdoors lost his balance and fell from the trucks and became unconscious. He was immediately shifted to the hospital where he died.

The investigation in to the accident revealed that it had taken place due to unsafe movement of the truck by the driver without any direction from the supervisor / signaler. The employer of the dock worker was warned for breach of Regulation 57(8) (b).

HEAT STRESS & HEAT DISORDERS ITS EVALUATION AND MANAGEMENT FOR SAFETY, HEALTH & PRODUCTIVITY AT WORK

PROGRAMME PERSPECTIVE

Heat is one of the industrial hazards in most of the tropical countries. India, being a major tropical country, this sub continent has its major share of heat casualties both industrial as well as natural. In India many a life is lost because of ignorance, lack of basic knowledge regarding heat stress and heat disorders and lack of safety awareness among the industrial population. The heat stress and the consequential heat disorders are such that with basic knowledge the shop floor colleges can take care of themselves. However, the most fatal casualties such as heatstroke, heat syncope, etc., are to be tackled by qualified doctors on emergency basis. This is because the thermoregulatory system of human being is attacked in these cases. The human thermo regulatory system is the main target organ in case of heat stress. The heat balance equation of human system is disturbed due to ambient condition of industrial environment. This man made and natural heat stress in work place has to be tackled . All these questions will be discussed in detail with special reference to prevention, for safety, health also to increase the productivity of the industrial population.

OBJECTIVE

To familiarize with

- Human thermoregulatory system in balancing heat.
- The consequences of heat stress.
- Management of heat stress and heat disorders for safety, health and increased productivity.

HIGHLIGHTS

- Causes of industrial heat stress.
- Effects of such heat stress on man and productivity, health, safety at large.
- Low cost prevention techniques for both man and machine
- Discussion of various problems encountered by individual workers among the participants/organization,etc. (case studies)
- **TECHNIQUES**
Discussion based on shop floor experience and case studies.
- Laboratory exercise/demonstration and exhibits.

PARTICIPANT PROFILE

Industrial Physicians, Plant Medical Officers, Audiologists, Physical and occupational physiotherapists, Hospital Administrators, Technicians, paramedical staff, Researcher & Architects, nursing professional, Production & Industrial Engineers, Safety professionals, etc., from various industries, establishments and Factory Inspectors and ESIC doctors, State & Central transport personnel, academicians etc.

FACULTY

Experts from the Central Labour Institute, Mumbai and a few guest speakers who have specialized knowledge and experience in the respective field.

Conducted by:

**Physiology & Ergonomics Div.,Central
Labour Institute, Sion, Mumbai.400022**

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

CIS (from the French name, Centre international d'Information de securite et d'hygiene du travail) i.e. International Occupational Safety and Health Information Centre, is a part of the International Labour Office, Geneva, Switzerland. The mission of CIS is to collect world literature that can contribute to the prevention of occupational hazards and to disseminate this information at an international level. CIS imparts to its users the most comprehensive and up-to-date information in the field of Occupational safety and health. The work of CIS is supported by a worldwide Safety and Health information exchange network which includes over 91 affiliated National Centres and 38 CIS collaborating Centres. Central Labour Institute, Mumbai has been designated as the CIS National Centre of India.

CIS can offer you rapid access to comprehensive information on occupational safety and health through:

- Microfiches on original documents abstracted in CIS DOC (CISILO)
- ILO CIS Bulletin "Safety and Health at Work"
- Annual and 5-year indexes
- The CIS Thesaurus
- The list of periodicals abstracted by CIS

EXCERPT FROM CIS DOC

Title: Radiographic abnormalities among construction workers exposed to quartz containing dust.

CIS ACCESSION NUMBER

CIS 03-315

ABSTRACT

Construction workers are exposed to quartz-containing respirable dust at levels that may cause fibrosis in the lungs. To measure the extent of radiographic abnormalities among construction workers primarily exposed to quartz-containing dust, a cross-sectional study on radiographic abnormalities indicative of pneumoconiosis was conducted among 1339 construction workers mainly involved in grinding, (jack)-hammering, drilling, cutting, sawing and polishing. Radiological abnormalities were determined by median results of the 1980 ILO system of three readers. Questionnaires were used for assessment of occupational history, presence of respiratory diseases and symptoms and smoking habits. An abnormality of ILO profusion category 1/0 and greater was observed on 10.2% of the chest radiographs and profusion category of 1/1 or greater on 2.9% of the radiographs. The average duration of exposure of this group was 19 years and the average age was 42. The predominant type of small opacities is presumably indicative of mixed dust pneumoconiosis. The prevalence of early signs of nodular silicosis was low (0.8%). An association between radiographic abnormalities and cumulative exposure to quartz-containing dust from construction sites was observed, after correction for potentially confounding variables.

Note:

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

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

PRODUCT NAME(S) : SODIUM BICARBONATE

HAZARDS IDENTIFICATION

Emergency Overview:

As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight

Flammability Rating: 1 - Slight

Reactivity Rating: 1 - Slight

Contact Rating: 1 - Slight

Lab Protective Equip: GOGGLES; LAB COAT

Storage Color Code: Green (General Storage)

POTENTIAL HEALTH EFFECTS

Inhalation: High concentrations of dust may cause coughing and sneezing.

Ingestion: Extremely large oral doses may cause gastrointestinal disturbances.

Skin Contact: No adverse effects expected.

Eye Contact: Contact may cause mild irritation, redness, and pain.

Chronic Exposure: No information found.

Aggravation of Pre-existing Conditions: No information found.

FIRST AID MEASURES

Inhalation: Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion: Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.

Skin Contact: Not expected to require first aid measures.

Eye Contact: Wash thoroughly with running water. Get medical advice if irritation develops.

FIRE FIGHTING MEASURES

Fire: Not considered to be a fire hazard.

Explosion: Not considered to be an explosion hazard.

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

Special Information: Use protective clothing and breathing equipment appropriate for the surrounding fire.

ACCIDENTAL RELEASE MEASURES

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. Small amounts of residue may be flushed to sewer with plenty of water.

HANDLING AND STORAGE

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Airborne Exposure Limits: None established.

Ventilation System: In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

Personal Respirators (NIOSH Approved): For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator.

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

Skin Protection: Wear protective gloves and clean body-covering clothing.

Eye Protection: Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products: Gaseous carbon dioxide.

Hazardous Polymerization: Will not occur.

Incompatibilities: Reacts with acids to form carbon dioxide. Dangerous reaction with monoammonium phosphate or a sodium-potassium alloy.

Conditions to Avoid: Heat, moisture, incompatibles.

TOXICOLOGICAL INFORMATION

Investigated as a mutagen, reproductive effector. Oral rat LD50: 4220 mg/kg. Irritation data: human, skin, 30mg/3D-I mild, rabbit, eye, 100 mg/30 S, mild.

ECOLOGICAL INFORMATION

Environmental Fate: No information found.

Environmental Toxicity: No information found.

DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

OTHER INFORMATION

NFPA Ratings: Health: 1 Flammability: 0 Reactivity: 0

Label Hazard Warning: As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

NOTE

The above details constitute part information of MSDS taken from Canadian Centre for Occupational Health and Safety. For complete MSDS write to MIS division, Central Labour Institute, Sion, Mumbai.400022. MSDS on about 1,20,000 chemicals/materials are available with Central Labour Institute. Computer printout will be supplied on nominal charge basis.

**TRAINING PROGRAMMES
JULY TO SEPTEMBER 2004
CENTRAL LABOUR INSTITUTE ,SION,
MUMBAI-400 022**

Programme title	Contact person
Diploma in Industrial Safety	Director (Safety) & Incharge Indl. Safety Division
Associate Fellowship of Industrial Health	Director (Medical) & Incharge Indl. Medicine Division
Workshop on Safety Audit	Director (Safety) & Incharge Indl. Safety Division
Managerial Excellence for higher performance	Director (Staff Trg./Productivity) & Incharge Productivity Division
Safety, Health & Environment Management in Chemical Industry	Director (Indl.Hygiene)&Incharge Indl.Hygiene Division
Workshop on Team Building for Safety, Health & Welfare at work	Director (Staff Trg./Productivity) & Incharge Staff Training Division
Occupational back pain – its evaluation and management for enhancing Safety, Health & Productivity	Director (Physiology) & Incharge Indl. Physiology Division
Physiological basis of Manual Material Handling for Accident Prevention & Productivity	Director (Physiology) & Incharge Indl. Physiology Division
Selection Criteria of Industrial Workforce for Safety, Health & Productivity at Work.	Director (Physiology) & Incharge Indl. Physiology Division
Wage & Salary Administration	Director (Staff Trg./Productivity) & Incharge Productivity Division
Safety Engineering & Loss Control Management	Director (Safety) & Incharge Indl. Safety Division

Training workshop on Hazard & Operability(HAZOP) studies

Director (Incl.Hygiene) & Incharge
Major Accident Hazard
Advisory Division

Industrial Ergonomics – its application in Industries for Promotion of Safety, Health & Increased Productivity at Work

Director (Physiology) & Incharge
Incl.Ergonomics Division

Understanding Human Behaviour for Safety, Health & Productivity

Director (Incl.Psychology) & Incharge
Incl.Psychology Division

Safety, Health & Environment Management in Drugs & Pharmaceutical Industry

Director (Incl.Hygiene)&Incharge
Incl.Hygiene Division

Industrial Heat Stress & Heat Disorders- its evaluation and management for ensuring Safety, Health & Increased Productivity at Work

Director (Physiology) & Incharge
Incl.Ergonomics Division

One month specialised certificate Course for Supervisors working in Hazardous Process Industries

Director (Staff Trg./Productivity.)
& Incharge Staff Training Division

Refresher course for Senior Inspectors of Factories

Director (Safety) & Incharge
Incl. Safety Division

Advanced training programme on Occupational Health & Environmental Medicine for Medical Officers

Director (Medical) & Incharge
Incl. Medicine Division

Occupational Back pain – its evaluation and management for enhancing Safety, Health & Productivity

Director (Physiology) & Incharge
Incl. Physiology Division

Occupational Health Hazards of VDT users in Office & Workplaces-its remedial measures through Ergonomics approach

Director (Physiology) & Incharge
Incl.Ergonomics Division

**TRAINING PROGRAMMES
JULY-SEPTEMBER 2004
REGIONAL LABOUR INSTITUTE , LAKE TOWN
KOLKATA-700 089**

Programme title	Contact person
Workers Development Programme	Director Incharge
Appreciation course on Industrial Hygiene	Director Incharge
HAZOP	Director Incharge
Training programme on Emergency Planning & Preparedness in MAHC Installation	Director Incharge

**TRAINING PROGRAMMES
JULY-SEPTEMBER 2004
REGIONAL LABOUR INSTITUTE , NO.1,SARDAR PATEL ROAD
ADYAR, CHENNAI-600 113**

Programme title	Contact person
Diploma Course in Industrial Safety	Director Incharge
Training Programme on Safety Audit	Director Incharge
Training Programme on Management of Hazardous Substances	Director Incharge

**TRAINING PROGRAMMES
JULY-SEPTEMBER 2004
REGIONAL LABOUR INSTITUTE, SARVODAYA NAGAR
KANPUR- 208 005**

Programme title	Contact person
Diploma Course in Industrial Safety	Director Incharge
Training programme on Team Building for Safety, Health & Welfare at Work	Director Incharge
Training programme on Work Environment – its assessment & control	Director Incharge
Training programme on Chemical Safety	Director Incharge
Workshop on Dispersion Modeling & Effect Calculations	Director Incharge

INDOSHNET

Ministry of Labour, Government of India, is developing a National Network on Occupational Safety and Health information system known as INDOSHNET. Directorate General Factory Advice Service & Labour Institutes (DGFASLI), an attached office of the Ministry of Labour will act as a facilitator of the network system. The objective of the network is reinforcement and sharing of national occupational safety and health (OS &H) information on no-profit no-loss basis with a view to pooling our information resources for mutual benefit. The sharing of information will not only confine to the national level but also includes international sources. The communication of information will be through E-mail as well as postal/courier service. DGFASLI invites industrial organisations, institutions, industry associations, trade unions, professional bodies and non-governmental organisations having information on OS&H and willing to share the same with others at the national and international level to participate as members in the network. Interested agencies may please write for proforma of organisational profile to Director General, DGFASLI, Central Labour Institute Bldg., N.S. Mankikar Marg, Sion, Mumbai 400 022.

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

NATIONAL REFERRAL DIAGNOSTIC CENTRE

Early detection and diagnosis of occupational health disorders and occupational diseases is one of the most important factors in the prevention and control of adverse health effects on workers due to various factors - physical, chemical, biological and psycho-social. The Industrial Medicine Division of Central Labour Institute, Mumbai runs a National Referral Diagnostic Centre (N.R.D.C.) for early detection and diagnosis of occupational diseases and recommends necessary measures for prevention/control of occupational health problems/occupational diseases. The diagnostic centre is well equipped for medical examination of the exposed workers and facilities are available for carrying out special investigation, e.g. Pulmonary function tests, Audiometry, ECG, Titmus vision test, Biological monitoring, etc. Medical professionals including Factory Medical Officers, ESI Doctors, Medical Inspectors of Factories and Certifying Surgeons, Doctors from Medical Colleges and Hospitals can refer suspected cases of occupational diseases to N.R.D.C. for diagnosis and advice. The communication should be addressed to the Director General, DGFASLI, Central Labour Institute Bldg., N.S. Mankikar Marg, Sion, Mumbai 400 022 for further details.

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

- 1. Manuscripts for publication should be typed in double space within 3 to 4 A4 size sheets only on one side of the paper and sent in duplicate to the Editor-in-Chief. No photographs can be published.**
- 2. Once the manuscripts are accepted for publication, publisher reserves the right to make editorial changes as may be necessary to make the article suitable for publication; and publisher reserves the right not to proceed with publication for whatever reason.**
- 3. Authors should take care to ensure the accuracy of data and reference.**