



Environment,  
health and safety  
guide

*Bata*



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## INTRODUCTION



*Bata houses for employees in Zlín*



*Bata training centre in Gweru*

Since its foundation in Zlín, in August 1894, the Bata Group has **always placed great emphasis in its values. Being a good corporate citizen**, our organization’s social and ethical engagement is part of the added value we put into our products. This guide follows this tradition with the strong desire to:

- **Improve the lives** of our employees
- **Exceed community expectations** on our environmental impact

Compliance begins with meeting all local requirements and extends to each of the core labour standards and EH&S requirements described in this document. Each company is responsible for following the principles described in this guide. At its core there are only **a few main ideas that should stay in everyone’s mind**; Every Bata company must:

- Be **fully compliant** with local laws and regulations
- Be fully compliant with **group minimum standards** when stricter than local regulation
- Adopt an EH&S approach that **methodically seeks new improvements** above regulation

The values, principles and rules embedded in this guide **apply to all facilities in the group**, including retail stores, depots offices, manufacturing facilities, tanneries and warehouses. Moreover, these principles **extend to our contractors and suppliers**. We recognize the importance of working with partners that share our values.

This guide provides our companies with practical ideas to organize and disseminate EH&S while helping them manage the process of continuous improvement. It can be summarized as follows:

- **Section 1, Governance** - The role of Management
- **Section 2, Continuous Improvement** - How to promote progress
- **Section 3, Workplace Organization** - Basic regulation in a Bata workplace
- **Section 4, 5, 6, 7, 8** - Specific rules for various type of risks and hazards



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## SECTION 1 - GOVERNANCE



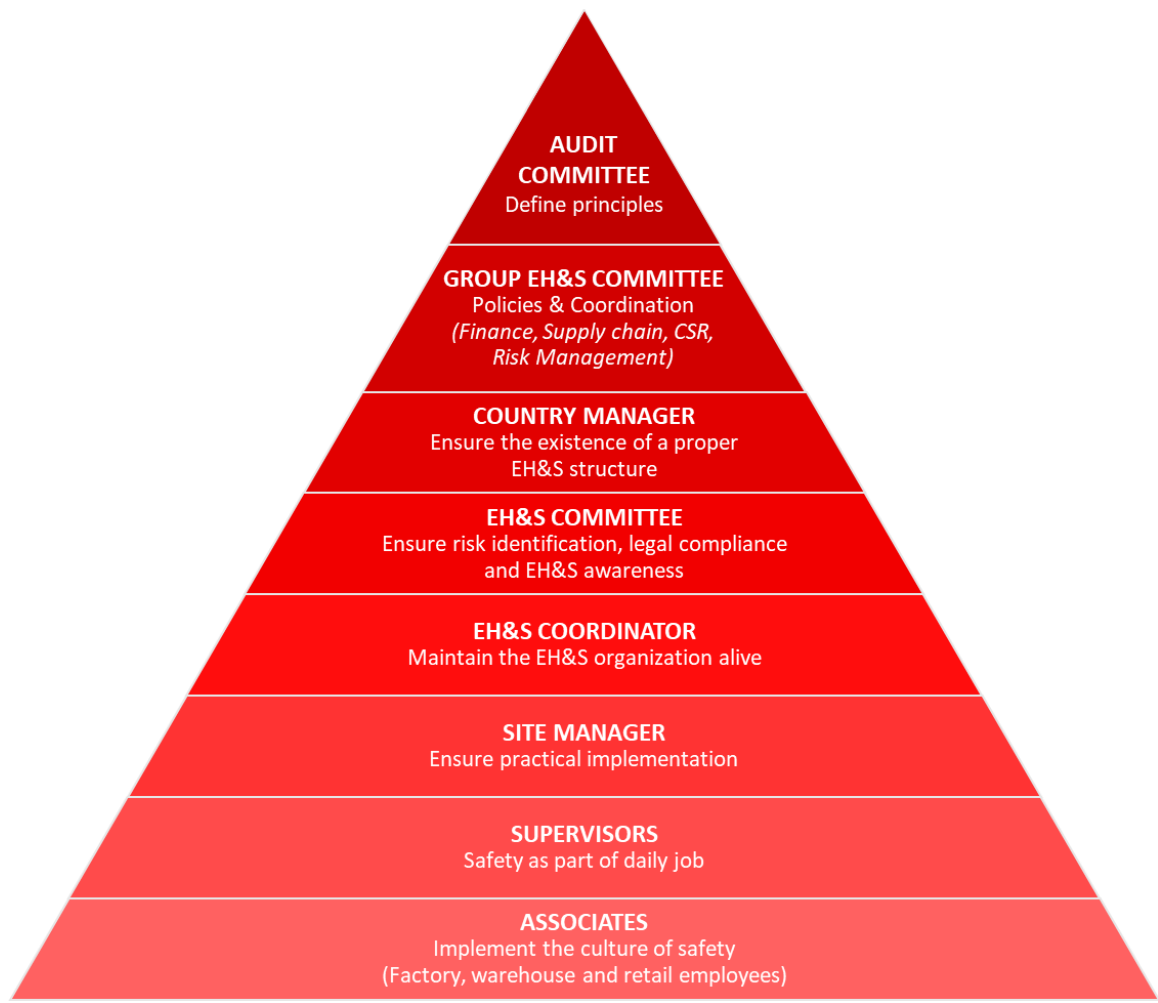


## 1. MISSION STATEMENT

*To protect our people, customers, communities and environment in accordance with the Bata's Values*

*To fully integrate EH&S into our business resulting in a healthy and safe workplace*

## 2. ROLES AND RESPONSIBILITIES







The EH&S organization described in this chapter can be adapted to the size and operations of every Bata company. The ultimate goal must be cascaded throughout the organization:

- Zero non-compliance with local law
- Zero accident or environmental issue
- Organization driven by continuous improvements

## 2.1 COUNTRY MANAGER

The Country Manager must ensure that EH&S principles are well embedded within the company. This includes the following responsibilities:

### EH&S ORGANIZATION

- Ensure the existence of a **proper EH&S Organization** including the nomination of an **EH&S Coordinator** and the participation to an active **EH&S Committee**.

### MANAGEMENT

- Delegate EH&S responsibilities and accountability across his company, with **clearly defined EH&S missions in targets and/or job descriptions**.

### BUDGET

- Adequately **consider EH&S** requirements and EH&S Committee recommendations in **Budget discussions**.

### LAW

- Ensure that the company **follows all local rules and regulations**.



## 2.2 SITE MANAGERS

All managers in the organization must adhere to EH&S principles and regulation; this guide focuses on “Site Managers”. A site manager has the responsibility of a business location. It can be the head of a factory, warehouse or retail stores.

The Site Manager is responsible for the practical implantation of EH&S rules. In particular:

### PERSONAL RESPONSIBILITES

- **Follow up on recommendations** to make sure they are adequately implemented.
- **Ensure the respect of all legal requirements** as communicated by the local authorities and the local EH&S organization.

### CONTINUOUS IMPROVEMENT

- Perform on-going **Risk Identification** and signal all changes of machines, procedures or unusual operations to the EH&S Coordinator.

### MANAGEMENT

- Make **EH&S a regular topic of operational meetings**.
- Place **emphasis** within the team on **hazard recognition and accident prevention**.
- Ensure supervisors/**employees are fully trained** and competent to meet their EH&S responsibilities.



## 2.3 SUPERVISORS

Supervisors may be production line managers, team leaders or store managers. They are the direct representative of management and should operate on the basis that accident prevention is an integral part of their job.

### PERSONAL RESPONSIBILITIES

- **Set a good example** by following good safety practices in all activities.
- Have a **thorough knowledge of the hazards** involved in every operation, and how the hazards can be controlled.

### CONTINUOUS IMPROVEMENT

- Perform a **job safety analysis** of any operations that have produced, or could produce, accidents, if necessary **with the help of the EH&S Coordinator**.
- **Inform upper echelon** of newly identified risks and incidents.

### MANAGEMENT

- **Instruct** employees in the safe way of doing their work.
- **Insist on proper use of machinery**, equipment and tools.
- **Correct** improper work habits **as soon as detected**.



## 2.4 EH&S COORDINATOR

The EH&S Coordinator is appointed by the Country Manager. It can be a **full-time position or an additional duty** depending on the complexity and size of the company.

The EH&S Coordinator is responsible for maintaining the EH&S organization alive, i.e. checking on new regulations, new risks, employee's training, improvement plans.

### MAINTAINING COMPETENCIES

- Keep abreast of all **current and potential laws** and regulations. This work should be performed with internal and external legal advisors. Main changes to be reported to the EH&S Committee.
- **Attend training courses and maintain a resource library** with technical reference books and periodicals.

### DISSEMINATE EH&S CULTURE

- **Organize the EH&S Committee meetings** (Agenda, Minutes, Follow-up)
- **Act as a liaison with external** regulatory agencies, equipment suppliers and external consultants.
- Assist the Country Manager in **establishing goals for the reduction of hazardous material** usage and waste minimization.
- Make sure that the suppliers respect the "**Bata Supplier Code of Conduct**".

### TRAINING

- Propose, coordinate and control **training initiatives**.
- **Educate and train employees**, particularly supervisory employees, in safety-related matters such as accident prevention, health hazards, etc.
- **Post written policies and procedures** in visible locations and communicate them to all employees.

### MONITORING

- **Analyze potential new risks** when new activities, machines are being implemented.
- **Keep track of all hazards and mitigation measures** in place.
- **Follow up on all recommendations and action plans** (Internal & External).
- **Investigate all accidents** and near misses and maintain current **records of all injuries** and illnesses.

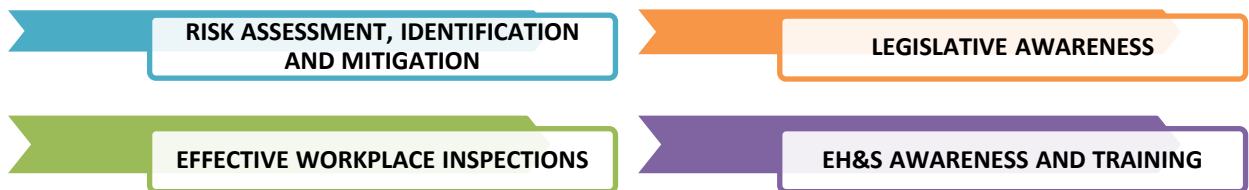
### 3. EH&S COMMITTEE

#### 3.1 ROLE

The EH&S Committee is the trans-functional body where important EH&S matters are discussed. It allows all stakeholders to evaluate issues, disseminate information and discuss financial implications at the highest level.

The Committee itself does not have authority in the company, however, it is the duty of its member to attend the meetings. **Recommendations of the Committee are submitted in writing to the Country Manager (or eventually directly to site managers) for careful consideration.**

In particular the EH&S Committee will ensure effectiveness on 4 elements:



Most companies will have only one EH&S Committee. Larger Bata companies can put in place local committees to supervise geographically-dispersed sites. These local committees have the same objectives and forward their recommendations or budget requests to the main EH&S Committee for review.

#### 3.2 MEMBERSHIP

The size and composition of the EH&S Committee may vary considerably depending upon the size of the company and other local circumstances.

However, in whatever format the Committee is arranged, the members (and the employees conducting the workplace inspections) should receive formal training in legislative awareness, effective workplace inspections, hazard communications, and so on.

**Ideally the Committee should be chaired by the Country Manager and should consist of the following representatives as deemed necessary:**



**Red:**

Core team

**Green:**

Optional, based on local needs

### 3.3 MEETINGS & AGENDA

The Committee will meet **every month for companies with manufacturing activities and every 3 months for others**. Frequency can be increased based on needs as determined by the Country Manager.

**Minutes of meetings** must be taken by an appointed secretary and should be distributed to all members. Minutes should include all suggestions and recommendations made and should also indicate what actions will be or have been taken.

#### SUGGESTED AGENDA

##### **Review of Legal Requirements**

1. Discuss changes in the legal framework if any

##### **Risk Identification**

2. Site visit and/or report on recent site visits
3. Analyze potential risks of new machines, processes or unusual activities

##### **Continuous Improvement**

4. Review action plans and corrective actions identified at the last meeting or by third parties
5. Review incidents occurring since last meeting

##### **Dissemination of Information**

6. Review Training status for Committee and Employees
7. Review quality and effectiveness of EH&S procedures and signage

##### **Reporting**

8. Report twice per year to the company's Board of Director (*Corporate Governance TAC #2*)



## 4. GROUP CONTROL

### 4.1 GROUP AUDIT COMMITTEE

EH&S in Bata is **ultimately under the supervision of the Group Audit Committee**. The Audit Committee is therefore entitled to receive regular update of the EH&S organization and its effectiveness.

The Audit Committee, in coordination with the Group Board of Directors, gives overall directions in term of **values, principles and improvement targets**.

The Group EH&S Committee is responsible to organize the reporting to the Audit Committee.

### 4.2 GROUP EH&S COMMITTEE

The Group EH&S Committee ensures that the EH&S organization recommended in this guide is in place and controls its degree of effectiveness.

The Group EH&S Committee will meet at least twice a year. Minutes of the meetings should be taken by an appointed secretary and should be at the disposal of the CEO and Audit Committee.

#### MEMBERSHIP

Size and composition of the Committee may vary but the following structure is recommended:

- Group Chief Financial Officer, Chairman
  - Group Chief Supply Chain Officer
  - Group Corporate Social Responsibility
  - Group Risk Management
  - Group Operations Review Director

#### BUDGET & RESSOURCES

The Group EH&S Committee is **allocated a budget from central resources**. This financing is used for:

- **Dissemination** of EH&S information (Website, training material...)
- **Control** (Third Party engineering visits, EH&S or Social audits...)
- Resolving any **gaps/issues identified** in the EH&S policies



## 5. CONTRACTORS & SUPPLIERS

EH&S Compliance does not stop at the door of our facilities. All works performed by an external entity on the behalf of Bata, have to be properly managed. This requirement extends to work performed by contractor of our suppliers (i.e. “subcontractors”).

### 5.1 SUPPLIERS

Bata values and EH&S principles must be passed on to our suppliers. Each company must communicate the “**Bata Supplier Code of Conduct**” to each of their Suppliers and/or Associated Business Units.

It is the responsibility of all suppliers to further communicate the Code to their own suppliers, subcontractors and agents (including employees) so that the complete supply chain is aware of what is expected by Bata.

<b>DIGNITY AND RESPECT</b>	The Supplier shall not use any form of forced labor, harassment, abuse or corporal punishment.
<b>MINIMUM AGE OF EMPLOYMENT</b>	The Supplier must follow the local minimum age of the country operated in.
<b>NON-DISCRIMINATION</b>	The Supplier shall not operate its business or subject any of its employees to discrimination on account of gender, race, color, religion, national origin, age, or disability.
<b>REMUNERATION AND BENEFITS</b>	The Supplier shall provide fair remuneration and benefits to its employees that comply with local laws. The Supplier must respect the timely payment to employees per their agreement.
<b>WORKPLACE STANDARDS</b>	The Supplier shall provide a safe, clean workplace which maintains high standards and protects each employee’s health and safety.
<b>NATURAL ENVIRONMENT</b>	The Supplier shall operate its business in a manner which recognizes the need to protect the natural environment.
<b>PRODUCT SAFETY</b>	The Supplier shall ensure that the goods that it supplies to Bata meet or exceed the minimum quality and safety standards. The Supplier shall fully cooperate in any product safety audit which may be conducted from time to time.
<b>PRISON LABOUR</b>	The use of prison or convict labour must be consistent with laws where the merchandise is manufactured, and with the laws where it is imported





Compliance by Bata Companies with the “Bata Supplier code of Conduct” will be verified by the Group and third-party auditors. Visits or audits should be made at least every two years.

The “Bata Supplier code of Conduct” is under appendix 35.2.

## 5.2 CONTRACTORS

On our site the contractor has to **adhere to all rules applicable to Bata employees** and are subjected to additional controls.

### PRE-START SAFETY MEETING

Conduct **pre-start safety meetings** and periodic meetings throughout the duration of the project. This meeting will bring the contractor up to speed with local safety rules and review the main elements of the work permit.

### THE FOLLOWING ARE SOME SPECIFIC RULES REGARDING CONTRACTOR SAFETY:



WEAR IDENTIFICATION BADGES



CONFORM TO ALL SAFETY REGULATIONS GOVERNING THE WORK OR PROJECT



THE CONTRACTOR SHALL LEAVE EACH WORK AREA CLEAN



PROTECTIVE EQUIPMENT MUST BE WORN



CONFINE YOUR ACTIVITIES TO THE DESIGNATED WORK AREA



PARK IN DESIGNATED AREA ONLY



UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR BE ALLOWED THE USE OF THE PLANT COMPRESSED AIR SUPPLY



STORE EQUIPMENT AND MATERIAL IN DESIGNATED AREA



NO WELDING OR GAS TORCH METAL CUTTING SHALL TAKE PLACE UNLESS A HOT WORK PERMIT HAS BEEN ISSUED



### WORK PERMIT

A specific work permit, written in a language understandable by on-field workers, shall be established for each operation, under the responsibility of the site manager.

#### **The permit shall include the following:**

- Risk assessment prior to the operation
- Designation of the authorized operator
- Time frame and location of operation
- Operational procedure
- Signed permission to carry out operations
- Procedures for returning the equipment and systems to a safe condition after the task has been completed

### CONTROL & SAFETY

- Designate an individual to **regularly inspect the work areas to ensure compliance with safe work procedures** and to ensure the highest housekeeping standards are maintained.
- Company equipment or tools should never be provided to outside contractors for use unless it is absolutely necessary. If it is necessary, the equipment must be in good condition, the person(s) must be adequately trained, and any required personal protective equipment provided.
- The plant personnel shall not receive, unload or accept deliveries of materials designated to the contractor.

### FINANCIAL ASPECTS

- Structure the contract to include a **waiver** by the contractor of claims against the company and its directors, officers, employees, agents.
- **Submission of certificates of insurance**, including workers compensation/employer's liability and environmental impairment liability coverage, with suitable limits.



## SECTION 2 - CONTINUOUS IMPROVEMENT



## 6. IDENTIFYING RISKS

### 6.1 EH&S AND THE LAW

Compliance with all applicable laws and regulations is a cornerstone of the policy of Bata Companies. This, of course, also applies to laws and regulations affecting the EH&S.

Each company should from time to time consult **a lawyer** who is an expert in the areas of environmental law and occupational health and safety.

The lawyer should advise as to **what laws and regulations are relevant**, what are the specific duties and responsibilities of senior management and employees, as well as the potential consequences of failure to comply.

Specifically, the Lawyer should be asked to advice on the following questions:

1. **Which laws and regulations** are currently in force in respect of the environment and occupational health and safety?
2. What specific actions are required on the part of the:
  - Company
  - Directors
  - Officers
  - Employees
 to comply with those EH&S laws and regulations?





## 6.2 VISITS AND INSPECTIONS

Visits or inspections by Third Parties provide fresh perspective on EH&S performance.

The company should both:

- Welcome the opportunity to improve
- Protect its interest



### OPPORTUNITY TO IMPROVE

**All the inspections or visits results have to be:**

- Documented
- Analysed by the EH&S Committee
- Followed-up with an action plan

Note that in case of authority inspections, circumstances which are likely to initiate a visit from an enforcement officer or inspector are:

- Routine company inspection
- Response to a complaint from within the community
- Response to an employee complaint
- Response to a spill or environmental incident

The cause should be understood and reviewed.

### PROTECTION OF COMPANY INTEREST

- When an inspector is carrying out an inspection, he should be **accompanied at all times by a company employee**, preferably one who is familiar with the environmental aspects of the company's operations.
- Identify a supervisor who will be in charge when an inspector arrives to avoid the situation of an employee, unfamiliar with the procedure, acting contrary to the procedure.
- For highly sensitive matters, **the company can consult with a lawyer regarding the rights of the inspector** and the limits of the inspection power. In some cases it might be useful to perform our own tests shortly after in order to provide a control against the results that were obtained by the inspector's testing.





## 6.3 JOB SAFETY ANALYSIS

Job Safety Analysis enables the supervisor to teach and to lead the employees systematically in order to obtain maximum job safety based on the consideration of safety.

### HOW TO PERFORM A JOB SAFETY ANALYSIS

These steps should be followed:

#### **1. DETERMINE THE JOB TO BE ANALYZED**

There are several issues that should be considered to determine the priority of safety analysis to be done. These issues include:

##### **A. Past Loss Record**

##### **B. Loss Severity Potential**

The fact that a job has never produced a significant loss does not mean it never will.

##### **C. Probable Occurrence Rate**

Both actual and potential losses should be considered in light of how often they can be expected to happen.

##### **D. The Unknown or Unfamiliar**

Whenever a new job is created, or changes are made to an existing one, there will be unknown or unfamiliar risks to be considered.

#### **2. BREAK THE JOB DOWN INTO STEPS**

To analyze a job, you must break it down into basic steps in the sequence in which they are done. Then these steps can be examined individually to determine the key production and safety factors necessary to ensure maximum efficiency.

A job “step” can be defined as “a logical segment of the operation when something happens to advance the work.”

#### **3. DETERMINE KEY FACTORS RELATED TO SAFETY AND PRODUCTION**

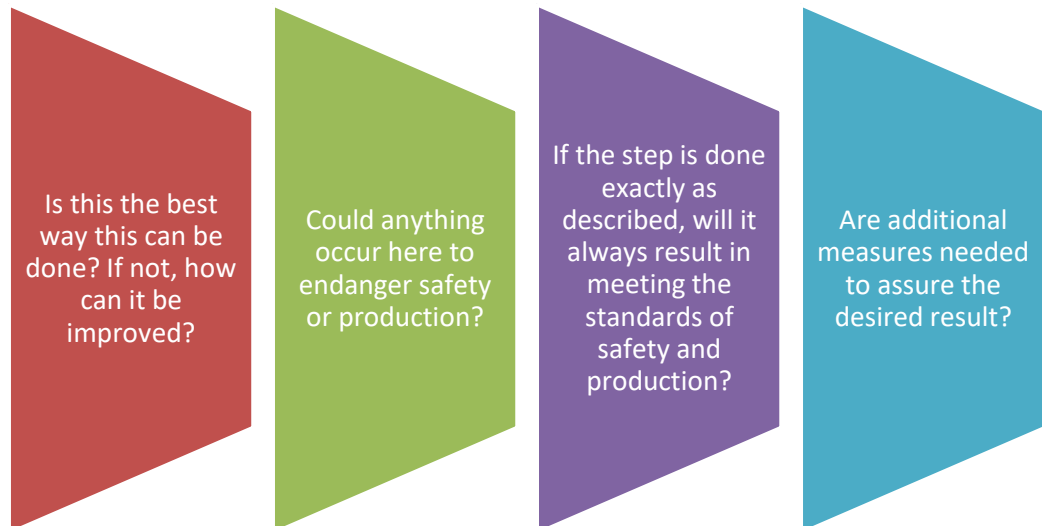
Though key factors can be determined in several ways, one of the best methods is job observation, actually watching the steps being done. In this method each step of operation is viewed from the standpoint of what is being done and why it is being done. A clear picture of the “what” and “why” of a step will easily identify key factors and their purposes.



**4. PERFORM “EFFICIENCY CHECK”**

This procedure involves checking each job step and key factors for deficiencies and developing solutions for these potential hazards. It is a procedure to guarantee maximum job efficiency by eliminating any conditions conducive to error or potential losses, as well as, understanding the potential financial implications of the changes.

One way to conduct this check is to take each job step and key factor and examine it by applying the following questions:





## 6.4 ACCIDENT REPORTING

The proper reporting and investigation of accidents greatly assists management in identifying the cause(s) of accidents and, if possible, taking steps to prevent them from happening again.

Accidents causing damages to an employee or to the environment must be reported and investigated. It is the responsibility of the EH&S Coordinator to organize the accident reporting (forms, process, investigations).

### 6.4.1 REPORTING GUIDELINES

- All accidents, no matter how minor, **must be reported** immediately to the supervisor and an **accident reporting form** completed. Ultimately this report must be transmitted to the EH&S Coordinator.
- All accidents which result in offsite medical attention and/or lost time must be reported to the Worker's Compensation Board, Insurance Carrier of the company and/or other indemnifying body promptly.
- Companies are usually required to file a report with government authorities after a serious/critical incident.
- **Fatalities and accidents that will get media coverage** have to be **reported to the Group immediately**.







## 6.4.2 ACCIDENT INVESTIGATION

### OBJECTIVES

- To identify all **contributing causes** and take **corrective actions**.
- To determine **if the accident was preventable** it is not a means of finding fault.
- To provide information necessary for accurately process Workers' Compensation and other insurance claims.
- To provide a **record** for future claims management.
- To incorporate the findings in **future training to avoid similar accidents**.

### METHODOLOGY

When conducting accident investigations, the following Guidelines should be followed:

- The investigation should be conducted **as soon as possible** after the accident.
- For serious accidents, a **written re-creation of the events** should be obtained from the injured employee(s) as soon as they are capable.
- Through **separate and private interviews**, statements should be obtained and documented from each employee who has knowledge of the accident.
- Determine **all accident causes**. Most accidents involve both the employee and his/her environment (physical surroundings) as causes.
- In the "Why", it is important to distinguish between the symptoms like "poor behaviour" and the true cause. **To determine the true causes, the Investigators must determine why the unsafe acts or conditions occurred**. These are called the Basic or Root Causes of Accidents.



## 7. TRAINING

### 7.1 TRAINING ORGANIZATION

#### 7.1.1 WHY

One of the most important elements of an EH&S program is employee training and education.

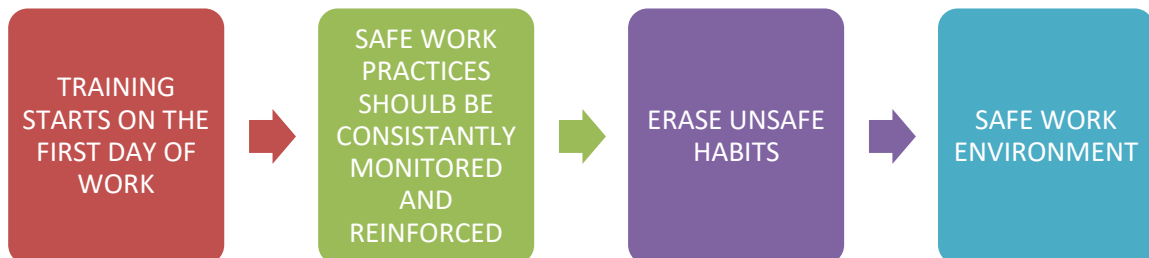
There are several reasons why EH&S must be built into the overall training and education program in all Bata Companies:

- **Accidents and injuries**, along with their costs and impact on productivity, can be avoided through EH&S training.
- EH&S training can prevent pollution incidents.
- In most countries, companies are **legally obligated** to provide EH&S training to workers, supervisors and managers.

#### 7.1.2 PROCESS

Safe work practices should be **constantly monitored and reinforced** because **once a poor or unsafe habit forms, it becomes extremely difficult to change.**

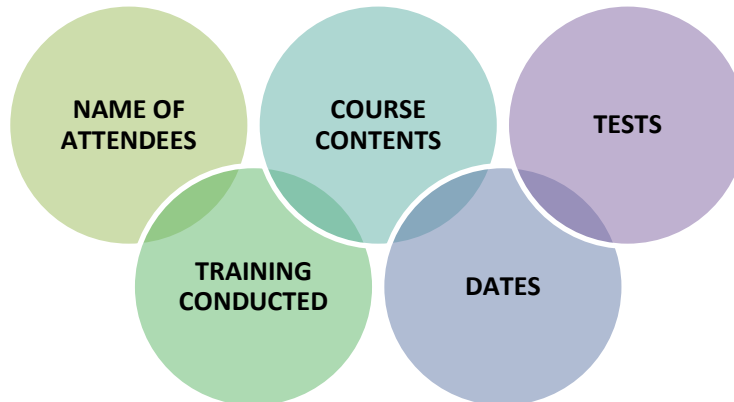
Safety training is **most effective if it begins the day the employee reports to work.**





### 7.1.3 DOCUMENTATION

All employees training should be documented and maintained by the Human Resources Department and/or by the EH&S Coordinator. Documentation includes:



## 7.2 INDUCTION

Below are some areas that could be included for First Day Orientation:

- Explain management's interest in accident prevention.
- Discuss company safety policies.
- Emphasize that accidents are preventable.
- Distribute and discuss safety rules.
- Explain how to submit safety suggestions, receive suggestions for improving safety practices or mechanical safeguards on equipment.
- Explain the employees' responsibilities to report any unsafe conditions and acts to their immediate supervisor.
- Explain that employees should not undertake a new job until they have learned how to do it and have been authorized by their supervisor. The supervisor usually provides job instruction training and safety training.
- Discuss the procedure to be followed for a personal injury or emergencies such as fire, chemical spills, natural hazards, etc.
- Promote the use of personal protective equipment.

### EFFECTIVE TRAINING TECHNIQUES

LESSONS	COMMENTS
<b>TELLING IS NOT TEACHING</b>	Learning does not take place merely by being told how to perform a task; tasks must be performed, and feedback received.
<b>PARTICIPATION IMPROVES LEARNING</b>	Employees should be urged to ask questions, answer questions and interpret material.
<b>FEEDBACK IMPROVES LEARNING</b>	Feedback corrects poor technique.
<b>POSITIVE REINFORCEMENT IMPROVES LEARNING</b>	Positive reinforcement occurs when the supervisor uses phrases like- “good for you” or “that’s right”. Employees repeat actions that lead to this praise.
<b>NEGATIVE REINFORCEMENT DECREASES LEARNING</b>	Criticism reduces learning. It occurs when the supervisor belittles the employee’s abilities or intelligence.
<b>ALLOW FOR INDIVIDUAL DIFFERENCES</b>	Allow for the needs of above-average employees who need an accelerated training schedule and those who need a slower approach.
<b>ENSURE TRAINING IS PRACTICAL</b>	The more relevant and interesting the more likely it is to be retained and used.
<b>SMALL STEPS ARE THE BEST WAY TO LEARN</b>	This allows the employee to ask questions and absorb information gradually.
<b>MOVE FROM THE SIMPLE TO THE COMPLEX</b>	Start at the beginning and sequentially introduce material logically.
<b>WE REMEMBER WHAT WE LEARN FIRST</b>	Ensure new employees are taught how to do it right the first time.



### 7.3 REFRESHERS

Safety in the workplace may be promoted through a variety of programs and initiatives including:

#### MEETINGS

In addition to the EH&S Committee meetings, it is recommended that Companies establish **safety meetings designed to promote awareness** and communications among management, supervisory and personnel. These meetings serve as **refresher on past trainings and update employees on new procedures**.

In factories, it is recommended to have one safety meeting per week and in stores one every semester. Periodically, it may be appropriate to conduct a site safety meeting involving all personnel.

#### SUGGESTED AGENDA FOR THE SAFETY MEETING

The agenda should be varied. Not all topics have to be addressed all the time. Supervisors can choose the topics, for example:

- PPE
- Smoking
- Evacuation
- First Aid

#### INCENTIVE PROGRAMS

Employee incentive programs are programs used to increase overall employee performance and promoting safety.

It is important to set clearly defined, easily understood and fair goals. Prizes / rewards rewarding these goals should be commensurate with the goal and be identified at the beginning of the program. Moreover, goals must be high enough to be a challenge.

#### PROMOTION PROGRAMS

Similar to the Incentive Programs described earlier, promotion programs are intended to increase the safety awareness of employees. However, these do not typically have awards or prizes, as in the incentive programs.

Instead they may rely on posters and bulletin boards.



## 7.4 SUPERVISOR AND JOB INSTRUCTOR ROLE

### 7.4.1 SUPERVISOR'S ROLE

Supervisors should be made aware that they play an important role in employee training.

**This role is as follows:**

- The supervisor should contact and **observe each new employee** daily to see that rules and regulations are being carried out and that correct working habits are being formed.
- Supervisors should be required to sign a statement (to be filed as part of the employee's personnel records) to the effect that an employee received instructions about safe work practices specific to his or her assigned job.
- A progress report from the supervisor should be obtained at the end of two weeks. This should state what progress the employee has made in complying with instructions and rules as well as other performance and attitude requirements.

### 7.4.2 JOB INSTRUCTOR'S ROLE

A job instructor should be assigned to each new employee.

For large departments, in the process of expansion or faced with heavy turnover, the supervisor should have an assistant who should devote the majority of his or her work time to training and handling new employees.

The instructor should be required to keep the supervisor informed of the new worker's progress and should have the following qualifications:

- Each instructor should know the operation and safe practices involved in the new employee's assigned job.
- Each instructor should take environmental protection and accident prevention seriously.
- Each instructor should have a "knack" for teaching and the ability to convey ideas that will stick.
- Each instructor should be a person who commands the respect of fellow workers.



## 7.5 TRAINING FOR SITE MANAGER & SUPERVISOR

### LEGAL OBLIGATIONS

All managers and supervisors must undergo training in the major elements of the EH&S program **and their legal obligations and responsibilities under the law.**

The inside or outside lawyer of the company should also be required to define those legal obligations and responsibilities.

### SUPERVISOR TRAINING

It is essential for management personnel to be thoroughly trained in the major elements of the EH&S program. They must, in addition, be given a good understanding of the basic logic of accident prevention techniques.

During an initial orientation session supervisor should be taught about the following:

- EH&S program basics
- The responsibilities of their subordinates in meeting program standards
- What actions of their own are necessary
- Knowledge about company safety standards and guidelines







## 7.6 TRAINING FOR EH&S COORDINATOR

The EH&S Coordinator must receive appropriate and sufficient education.

### INITIAL EDUCATION

- learn relevant EH&S, audit, technical skills from a credible agency/university.

### CONTINUING EDUCATION

- every year should the Environmental Coordinator take formal courses or enroll in controlled and examined self-study programs
- he should attend professional development conferences, congresses and seminars.

The EH&S Coordinator acts as a communications link internally with managers and supervisors and externally with government or health and safety services. He will be instructed to assist the design and content of EH&S training.

The EH&S Coordinator should obtain a list of available materials from local environment, health and safety associations, and should select those most applicable to his company. Pamphlets, videos, etc. are all helpful tools which should be used to properly train and orientate new and existing employees.



## SECTION 3 - WORKPLACE ORGANIZATION





## 8. CLEANING & BUILDING MAINTENANCE

A safe and clean environment contributes to a better life quality for the employees.

### 8.1 CLEANING SCHEDULES

- are systematic and well planned
- have routine daily cleaning conducted during quiet/slow periods
- include periodic cleaning
- provide a rapid/urgent response to spills
- include indoor and outdoor areas
- accommodate for periods of bad weather

### 8.2 CLEANING EQUIPMENT/PRODUCTS

- suited to the task, environment and users
- includes barriers and signs to keep people off any wet areas if 'clean-to-dry' is not possible

### 8.3 PERSONNEL RESPONSIBLE FOR CLEANING

- cleaners are trained, equipped and supervised to do routine cleaning
- all workers assist in spot cleaning/spills management
- supervisors are trained and able to oversee work practices
- workplace visitors and others are encouraged to report hazards where appropriate

### 8.4 MAINTENANCE

There should be regular inspection and maintenance of all production machinery to ensure that all safety devices and mechanisms are effective, and inspection and maintenance records should be maintained by the factory.

Appropriate lockout/tagout procedures should be implemented during all equipment maintenance and repair work.

## 9. SMOKING POLICY

Sites must adopt a non-smoking policy that forbids smoking everywhere except in dedicated smoking areas located outdoor. Remind smokers to properly extinguish cigarettes before leaving smoking areas by means of clear signing.

This policy prohibits the use of electronic nicotine delivery systems (also known as ecigarettes, e-cigars, e-hookahs, and e-pipes) anywhere that tobacco smoking is prohibited.

**In particular, the following locations must be subject to a strict smoking prohibition and control:**

- all stores and storage areas
- all electrical rooms, control rooms (control, data processing and telecommunications rooms)
- archives
- locations where flammable liquids and/or flammable or explosive gases are handled
- locations usually vacant
- all locations where there is a serious risk of fire or explosion



## 10. DRUG AND ALCOHOL POLICY

Drug and alcohol use can affect a person's ability to work safely. It creates a risk to workers and work health and safety.

No one must drink alcohol or use drugs at his workplace and before arriving at his workplace.

Employees found to be in violation of this policy by either using alcohol or drugs, as described above, will be subject to disciplinary action.



## 11. PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment “PPE” is the last line of defense against injuries and illnesses. If all practical efforts to reduce hazards have been taken through engineering and administrative controls, and the worker could still be exposed to injury or illness, there is no option but to provide suitable PPE. Bata Companies must establish PPE requirements based upon any specific hazards present in the workplace.

### PPE PROGRAM

#### **Identify Activities Requiring PPE - This may be done through the following:**

- Health and Safety laws and regulations specify when and under what circumstances PPE is to be provided.
- Survey the entire workplace, identify activities which expose employees to illness or injury from:
  - flying objects
  - falling objects
  - falls from elevations
  - chemicals
  - temperature Extremes
  - electricity
  - noise

#### **Selection of The Proper Type of PPE For the Hazard**

Generally, all types of PPE must conform to government standards.

#### **Fitting and Wearing**

Each PPE must be properly fitted. Additionally, the use of PPE must be rigidly enforced.

#### **Maintenance**

PPE must be inspected before each use. It should also be cleaned and stored in clean, dry environments away from exposure to direct sunlight or contaminants. Ensure manufacturers’ recommendations are followed for all PPE.

#### **Training**

All employees must be trained how to fit, wear and maintain their PPE. Visitors and contractors are required to conform to the PPE Program. An ample supply of safety glasses, hats/caps, ear plugs and toe caps are to be provided where necessary for use by visitors and contractors.



## 12. VEHICLES POLICY (DRIVING POLICY AND FORKLIFT)

### 12.1 DRIVING POLICY

The speed limit in the Bata premises is 10 km/h. A sign should be placed at the entry of the gates.



For large compounds, where there is a long distance between buildings, the speed limit is set to 20 km/h.

#### BATA VEHICLES/TRUCKS

On a periodic basis, checks should be made to ensure appropriate documentation is with the driver including, registration, driver and vehicle permits, certificates of insurance etc.

The vehicle itself should be inspected for its condition, proper placarding, cleanliness etc.

An inspection checklist should be developed and used for this purpose, completed and retained.

### 12.2 FORKLIFT TRUCK SAFETY RULES

#### EACH FORKLIFT SHALL HAVE THE FOLLOWING MARKINGS:

- Authorized operator only
- Load capacity: xxx kilograms
- Stop engine to fuel (small letters at ignition)
- Remove key on dismounting (small letters at ignition)
- A yellow, blinking warning light, front and rear ends
- A “slow moving vehicle” marker when used off the site



#### EACH FORKLIFT SHALL HAVE THE FOLLOWING ITEMS:

- An appropriate fire extinguisher (B-C type - 1.1 kg. minimum capacity) with operators trained for its proper use
- Warning horns loud enough to be heard clearly above other local sounds (Driver operated)
- A reverse alarm which activates whenever the forklift backs up (automatically operated)
- An overhead guard

- Flashing lights mounted on the overhead guard (to warn employees if excessive background noise drowns out the warning horn)
- Guards for exposed tires and all hazardous moving parts (such as chains and sprocket drives) to protect the operator



At the beginning of each shift the operator shall conduct a circle check of the lift truck.

Immediately report any failure to the supervisor. The supervisor shall advise Maintenance to either repair or remove the forklift from service.

Schedule each forklift for an **annual safety inspection** to include brakes, brake drums, transmission, and the hydraulic system.



No person is permitted to stand or pass under the elevated portion of a forklift (whether it is empty or loaded).



No passengers are allowed on forklifts.

Personnel being elevated on a work platform must have access to a control to shut off power to the truck. The lifted platform must be secured to the lifting forks.



Pedestrians have always the right-of-way and must be respected at all times.



Sound the warning horn at cross aisles, doorways, corners, and other locations where vision is obstructed. Stop at designated signs.



Travel in reverse when the load obscures the view.

Travel down ramps in reverse.



Always travel with the load tilted back and close to the ground.



Palletizing, piling and storing can be dangerous if not done properly. Be certain of the proper method before starting a job where palletizing, piling and storing are involved.



Maintain adequate clearances at all times from overhead fixtures or equipment, doorways, shock bins or racks, and from the edge of ramps or platforms. Low overhead pipe work and cable conduits should be clearly marked and the safe working height for the forklift mast prominently displayed.

In any type of storage work, make sure that stacks are sufficiently below the sprinkler heads. Forty-six (46) centimeters for noncombustible and ninety-two (92) centimeters for combustibles.



Never operate at speeds over 8 kilometers per hour. Imbalances on forklifts occur due to high speeds, turning too fast, carrying loads too high, or exceeding the maximum load specifications.





## 13. UNUSUAL ACTIVITIES

### 13.1 HOT WORK

Hot work is defined as any activity that involves open flames or produces heat and/or sparks capable of initiating fires or explosions. Hot Work can be cutting, welding, soldering and brazing operations for construction/demolition/maintenance/repair activities that involve the use of portable gas or arc welding equipment.

A lack of precautions before, during and after work on hot points is one of the primary causes of fire in industry.

#### 13.1.1 HOT WORK PERMIT

The hot work permit provides a step-by-step check list for hot work fire safety and serves as a reminder to individuals of their fire prevention responsibilities.

Hot work permits can only be issued by people with a sufficient level of competence and authority to stop the work if the required precautions are not in place or to plan this work when there will be no other incompatible works: flammable liquids handling, cleaning with solvents, fire systems maintenance, etc.



**It is possible for a facility to produce its own permit, as long as it contains the following essential points:**

- the applicant, specifying his position (department, external company)
- the nature of the work
- the date and duration of the work
- the zone or area in which the work will be carried out (this zone must be clearly defined)
- the protective measures provided (insulating covers, screens, removal of flammable liquids)
- fire-fighting means provided (extinguishers, fixed fire-fighting systems, fire fighters)
- signatures (dated) of authorized operator, inspector



### 13.1.2 MONITORING OF HOT WORK

#### Before the work

- Check that equipment is in good order.
- Define the hot work area (allow a radius of 10m around the hot work site, consider extending this distance in case of wind or location near ventilation) and remove, protect or recover combustible materials (also check adjacent locations) that may be present in the hot work area.
- Make sure that the degassing of pipes has been effective (degassing with steam, by the injection of inert gas), take measurements with an explosimeter, create effective ventilation.
- Provide manual firefighting means near the hot work site (CO<sub>2</sub> and water extinguishers, fixed fire-fighting systems).
- Identify the closest alarm call points.

#### During the work

- Move gas bottles away, monitor points where flying ash may fall and cool these if necessary, ensure that hot parts are not placed on a surface that is easily ignitable, etc.
- Be ready to extinguish any fire that may start.

#### After the work

- Check the place of work and its surroundings, in particular where there is communication via piping or ventilation ducts, especially concealed areas such as false ceilings or hollow partitions where a smoldering fire may start without being noticed.
- Cool the parts that are likely to have accumulated heat during the work.
- Institute a fire watch at the end of the work and for two hours after the work.
- Report the slightest incident.
- Advise the guard's office and the workshop team head according to the work carried out (submission of a copy of the hot work permit drawn up).



## 13.2 WORKING AT HEIGHT

The term “Working at height” is carrying out a task in any place, including a place at, above or below ground level, where a person can be injured if they fell from that place.

- Use of a kick stool
- Use of any ladder
- Working on a flat roof
- Working at ground level adjacent to an open excavation
- Working near or adjacent to fragile materials

All work at height (painting, roof,..) must be closely monitored and safety measures taken. For any work at height documented risk assessments have to be kept. Moreover, the staff has to be adequately trained to fulfil their tasks and given appropriate equipment in good working order.

### SAFE USE OF LADDERS

All portable wooden and metal ladders should be inspected regularly for damage or defects and should be removed from service until the completion of any necessary repairs.

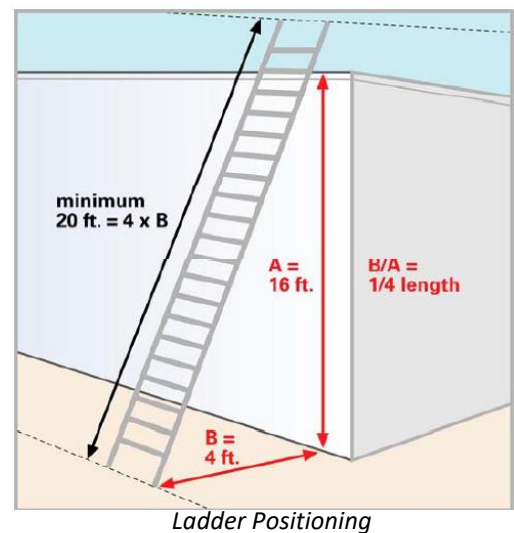
The inspections should include the following:

- Ladders should be free from sharp edges and splinters
- There should be no broken steps, rungs or side rails
- Steps or rungs must be in good condition
- A locking device should be available for step ladders so that they are secure when opened

As a general rule, ladders should be positioned at a pitch so that the working height is 4 times the horizontal distance from the foot of the ladder to the wall.

### STAFF SAFETY:

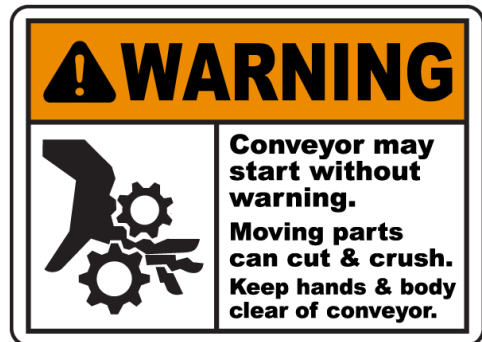
- When ascending or descending, the climber should face the ladder.
- A ladder should not be used by more than one worker at the same time.
- Ladders should not be placed on boxes, barrels or drums to obtain additional height.
- Ladders should not be tied or fastened together for additional height.
- Ladders should not be used in a horizontal position as a platform or scaffold.



### 13.3 WORKING WITH CONVEYORS

While conveyors do an excellent job of reducing labour, their designs create a variety of hazards. With moving parts like gears, chains, and belts and high-horsepower and high-speed power transmission systems, there are many places that present hazards.

A large number of accidents occur during cleaning (30%) or during the maintenance of or near a conveyor belt in motion (26%). Accidents occurring during normal production activities (sorting, packaging, etc.) are less frequent (12%).



A common source of injury is absent-mindedly reaching into a powered conveyor mechanism to remove an item that has jammed the conveyor. Another is trying to perform maintenance on a conveyor while it's in operation. In addition, it's far too easy for a worker's clothing to get caught in an operating conveyor, dragging an arm or a leg into the mechanism.

#### 13.3.1 RISK ASSESSMENT AND REDUCTION

As with many occupational risks, the hazards cannot be eliminated completely, but the danger can be reduced through **engineering and safe work practices**.

Conveyor safety begins with an assessment of the hazards, which vary based upon the conveyor's type, its location and installation, how workers interact with it, and the types of material it carries.

**Implement the following control measures:**

- 1) **Eliminate or reduce** the hazard through **design methods**.
- 2) Install **safeguards** or **protective devices** for each hazard that cannot be eliminated or reduced through design methods. Evaluate the need for additional controls (warnings, signs, work procedures, personal protective equipment, etc.).
- 3) **Inform workers of all hazards**

#### 13.3.2 LOCKOUT PROCEDURES

**The goal of lockout procedures** is to allow workers to carry out their tasks (maintenance, repairs, cleaning, etc.) on a conveyor and its accessories (bumpers, ejectors, etc.) without risk.

**Lockout procedures involve the following basics:**

- Bringing the machine to a complete stop.
- Disconnecting all the machine's sources of power: electric, pneumatic, hydraulic, mechanical and thermal.
- Dissipating all accumulated energy (purging reservoirs, removing counterweights, unloading springs, etc.) and checking for absence of energy.
- Padlocking of energy disconnect devices by each worker accessing the work area.
- Double-checking to ensure that the equipment is in fact disconnected.



## SECTION 4 - HAZARD PREVENTION





## 14. FIRE

Each year industrial fires cause injuries and loss of life and property. These losses can be avoided with the proper implementation of fire prevention measures and emergency preparedness.

### 14.1 FIRE RISK ANALYSIS

The EH&S committee has to ensure that each Bata company performs a fire risk analysis.

This analysis shall consider:

- Each potential hazardous source
- Each phase of activity (start up, shutdown, maintenance...)
- Potential new projects (extension...)
- Interaction with nearby facilities
- Legal compliance requirements
- Incidents / accidents feedback

The EH&S Committee approves the fire risk analysis that is further used for the identification and control of the fire risks.

### 14.2 FIRE SAFETY GUIDELINES

<ul style="list-style-type: none"> <li>▪ Fire alarm systems (sound and light) should be installed which are distinct from other alarms and notification systems:             <ul style="list-style-type: none"> <li>○ Full testing of alarm systems every three months</li> <li>○ All records of tests, maintenance, repair or replacement of alarm systems should be retained</li> </ul> </li> <li>▪ Emergency lighting should be installed along exit routes, at exits, in stairwells, and at other appropriate locations:             <ul style="list-style-type: none"> <li>○ Lighting should be &gt;1 lux</li> <li>○ Inspection and testing with documentation every month</li> <li>○ Illuminated “exit” signs with back-up power supply are required at exits and along egress routes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Automatic sprinkler system operation:             <ul style="list-style-type: none"> <li>○ An independent water supply for the sprinkler system is required.</li> <li>○ Pressure checks of the water storage container should be conducted every 5 years and documented.</li> <li>○ Water level and pressure, water pumps and the general condition of related equipment should be inspected monthly.</li> <li>○ Sprinkler heads should be kept clean.</li> <li>○ Water flow through the sprinkler system should activate the building fire alarm.</li> <li>○ Sprinkler piping should not be used to support unrelated equipment or materials.</li> </ul> </li> </ul>
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<ul style="list-style-type: none"> <li>▪ Exit signs should be clearly understandable with pictogram and wording in English and the local language.</li> <li>▪ Assembly areas outside the building should be designated and should not interfere with emergency service.</li> <li>▪ Fire hydrants and fire hoses should be inspected and tested at least twice yearly and have control tags as documentation.</li> </ul>	<ul style="list-style-type: none"> <li>○ There should be at least 0.45 metre clearance between sprinkler heads and stored materials.</li> </ul>
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### 14.3 ORGANIZATION

#### 14.3.1 FIRE EVACUATION DRILLS

At least **two evacuation drills** should be conducted each year. At least one of these drills in each location should be accompanied by a power shutdown to test the emergency lighting and alarm systems.

It is better, when possible, to **integrate local fire-fighters** when realizing drills.

Drill records should include fire drill plan and arrangements, the fire procedure, fire emergency plan, the process of the drill, existing problems, and improvements.



#### 14.3.2 DOCUMENT CONTROL

Each company must keep updated all necessary information required to justify the control of the fire risk (fire risk analysis, fire risk control master plan, fire drills plan, training plan...).



## 14.4 FIRE DETECTION SYSTEMS

An important factor in the prevention of losses from fire is a prompt and reliable detection.

Automatic fire detection systems can provide early detection and warning of fire or smoke. They may be used to initiate an alarm or to activate a fire protection system (fire extinguishing system, fire doors...) or both.

Properly specified, designed, installed, maintained, tested and used, a fire detection system can help limiting property fire losses in buildings, regardless of occupancy.

The requirements for fire detection shall be determined as a result of a risk analysis.

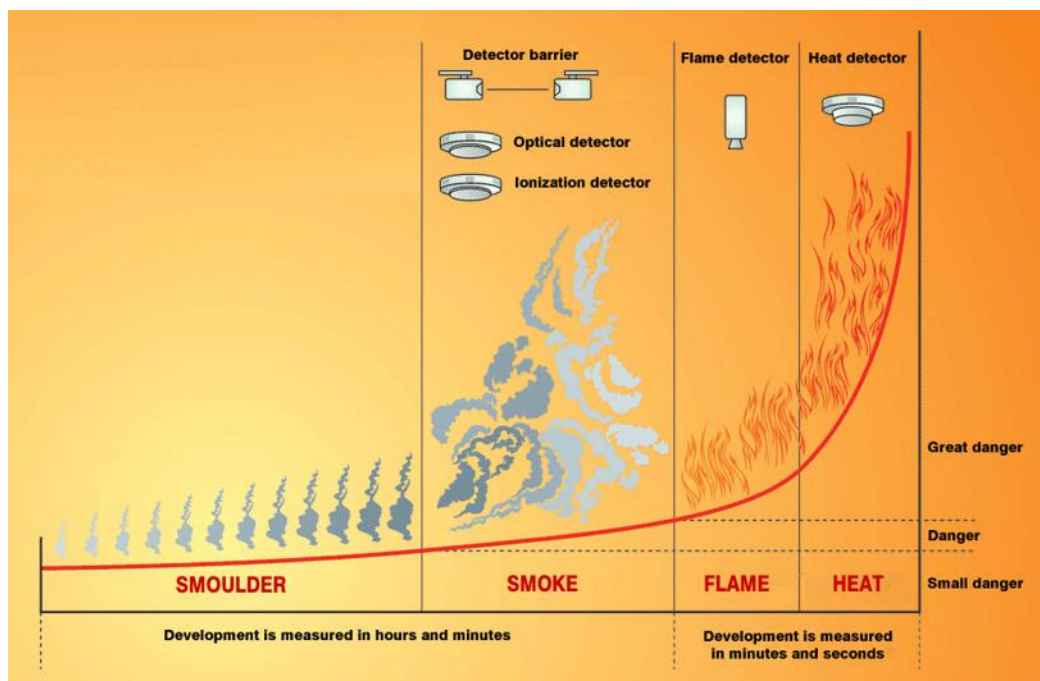
### DESCRIPTION

The main mechanisms of fire detection are based on the analysis of the physical parameters of a fire: temperature rise, radiation, smoke and combustion gases.

The key of a prompt and reliable detection begins by the choice of the adequate fire detector technology.

The different types of detectors are:

- Smoke detectors (detector barrier, optical and ionization detector)
- Flame detectors
- Heat detectors



In general, **smoke detectors** give appreciably faster responses than heat detectors, but may be more liable to give false alarms if not correctly installed. They are better suited than heat detectors



to protect large open spaces because smoke does not dissipate as rapidly as heat does in the same sized space.

**Flame detectors** are well suited to protecting areas where explosive or flammable vapours or dusts may be present because they are usually available in “explosion proof” housings. They are particularly suitable for use in applications such as the general surveillance of large open areas in warehouses or timber yards, or the local surveillance of critical areas where flaming fire may spread very rapidly, e.g. pumps, valves or pipe work containing combustible liquids or storage areas containing flammable liquids.

**Heat detectors** have a greater resistance to adverse environmental conditions than other types. They have the lowest false alarm rate, but they also have the slowest response time.

#### **INSPECTION / TEST / MAINTENANCE**

**At least once a year**, site management must ensure that the certified installer or certified servicing company:

- carries out a general check and perform necessary adjustments
- checks each detector for correct operation and each transmission path with detectors
- checks the alarm signaling devices
- checks the control and indicating equipment inside or outside
- checks the power supply equipment
- makes a visual inspection to check whether structural or occupancy changes have affected the requirements for the siting of detectors and sounders
- makes a visual inspection to confirm that all cable fittings and equipment are secure, undamaged and adequately protected
- replaces components which have a limited lifetime (e.g. battery....)
- checks that any fault warning recorded in the logbook has been considered

**Certificates of verification should be delivered after every maintenance operation.**

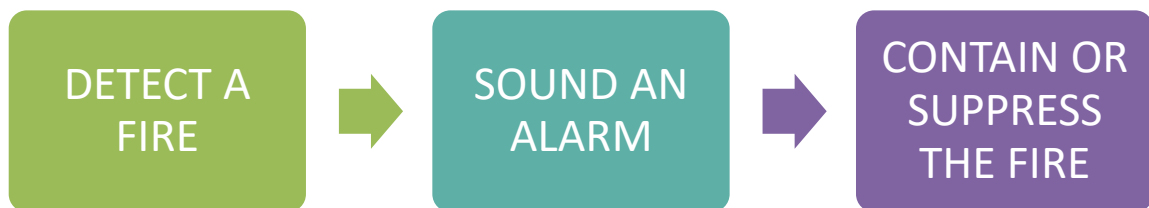
## 14.5 FIRE PROTECTION

### 14.5.1 SPRINKLER SYSTEMS

A sprinkler system is a fire suppression or control device that operates automatically when its heat-activated element is heated to its thermal rating or above, allowing water to discharge over a specified area.

Because a fire is sudden and not predictable, automatic sprinkler protection is one of the most efficient solutions to control a fire.

**The role of automatic sprinkler protection is to:**



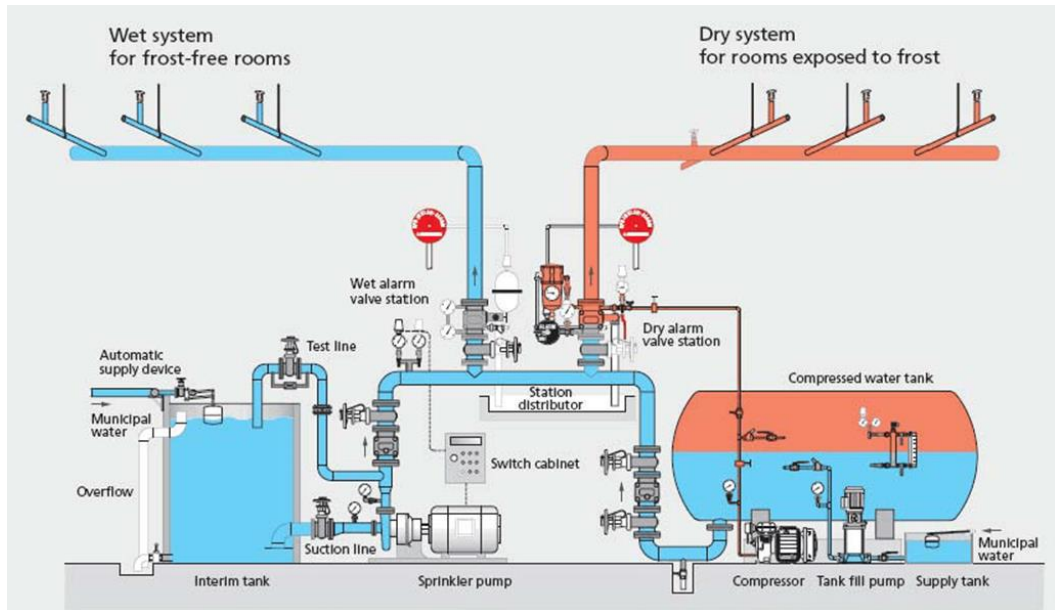
Automatic Fire Protection systems should be installed based on the analysis of the fire risk configuration (combustible load, propagation risk...) and the strategic content of the buildings (Production facilities, high value or strategic storage, and other critical areas).

#### Components of a fire sprinkler system

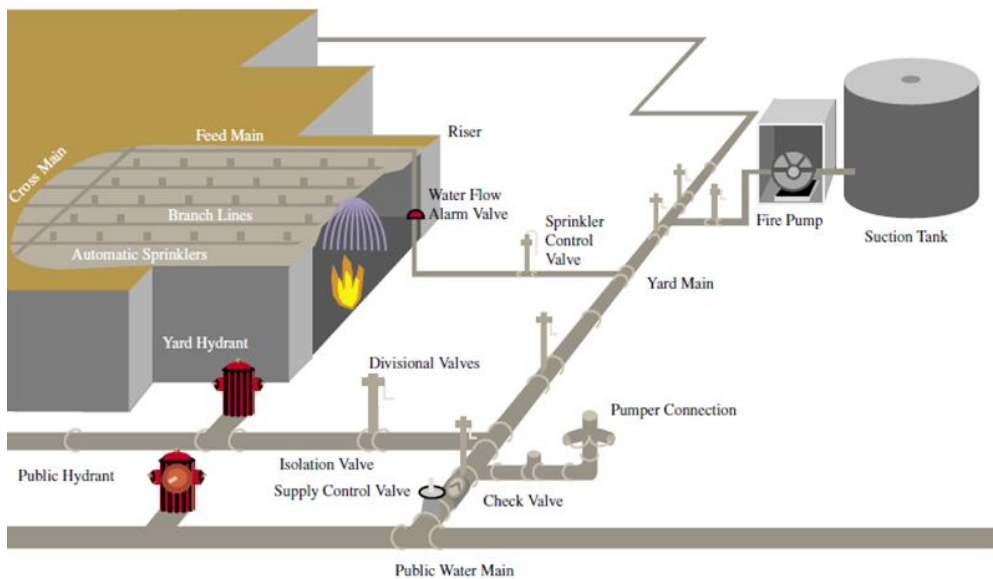
- Water supply
- Fire pump
- System distribution piping
- A discharge nozzle
- Control valves
- An alarm notification device



**SPRINKLER SYSTEM (WITH DRY AND WET SYSTEMS).**



**VIEW OF A COMPLETE SYSTEM**



**INSPECTION / TEST / MAINTENANCE**

Although sprinkler systems are very reliable, competent maintenance and close supervision are essential to ensure proper operation. Regular inspections of the sprinkler system and of associated equipment are essential.

**MAINTENANCE OF SPRINKLER SYSTEM**

<b>EQUIPMENT</b>	<b>TYPICAL MAINTENANCE</b>	<b>FREQUENCY</b>
<b>ALARM CHECK VALVES</b>	<ul style="list-style-type: none"> <li>• Inspect and clean</li> </ul>	<ul style="list-style-type: none"> <li>• Every five years</li> </ul>
<b>ALARMS</b>	<ul style="list-style-type: none"> <li>• Test electric and hydraulic</li> <li>• Lubricate</li> </ul>	<ul style="list-style-type: none"> <li>• Monthly</li> </ul>
<b>CHECK VALVES</b>	<ul style="list-style-type: none"> <li>• Inspect and clean</li> </ul>	<ul style="list-style-type: none"> <li>• Every five years</li> </ul>
<b>CONTROL VALVES (PIV, WPIV, IBV ETC.)</b>	<ul style="list-style-type: none"> <li>• Fully close and reopen</li> <li>• Lubricate and inspect</li> </ul>	<ul style="list-style-type: none"> <li>• Annually</li> <li>• Weekly / Monthly</li> </ul>
<b>DRY PIPE VALVES, PREACTION VALVES, DELUGE VALVES</b>	<ul style="list-style-type: none"> <li>• Trip test</li> <li>• Inspect</li> <li>• Clean</li> </ul>	<ul style="list-style-type: none"> <li>• Annually</li> </ul>
<b>DRY PIPE SPRINKLER SYSTEM</b>	<ul style="list-style-type: none"> <li>• Perform flushing investigation</li> </ul>	<ul style="list-style-type: none"> <li>• At 15 years</li> <li>• At 25 years</li> <li>• Every five years thereafter</li> </ul>
<b>FIRE PUMPS</b>	<ul style="list-style-type: none"> <li>• Test start automatically</li> <li>• Test and lubricate driver</li> <li>• Flow test</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly</li> <li>• Weekly</li> <li>• Annually</li> </ul>
<b>MAIN DRAINS</b>	<ul style="list-style-type: none"> <li>• Flow</li> </ul>	<ul style="list-style-type: none"> <li>• Monthly</li> </ul>
<b>PRESSURE-REDUCING VALVES</b>	<ul style="list-style-type: none"> <li>• Inspect</li> <li>• Test</li> <li>• Flow test</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly</li> <li>• Monthly</li> <li>• Annually</li> </ul>
<b>PUMPER AND STANDPIPE CONNECTIONS</b>	<ul style="list-style-type: none"> <li>• Inspect</li> </ul>	<ul style="list-style-type: none"> <li>• Annually</li> </ul>
<b>SPRINKLERS AND PIPING</b>	<ul style="list-style-type: none"> <li>• Inspect</li> </ul>	<ul style="list-style-type: none"> <li>• Weekly</li> </ul>

The site management is fully responsible for inspecting, testing, and maintaining the site sprinkler systems.



## 14.5.2 FIRE HOSE REELS

In case of fire, the purpose of fire hoses is to provide a steady flow of water while awaiting Fire Department intervention.

The advantage of fire hoses compared to fire extinguishers is that it enables one to fight fires from a further distance with a continuous flow of water (it should be noted that the greater distance reduces sharply the intensity of thermal radiation to which the concerned individual is exposed).

There are two main types of fire hoses:

A fire hose reel is a pressurised fire water hose which can be used for first and second level response;

Fire hose racks (or fire hose box) does not permanently contain water and can be only used by second level response.



If hose reels are exposed to freezing temperatures, it is necessary to set up a reliable, efficient and acceptable solution to keep it available in any circumstances, such as air or glycol installation.

### **DESIGN AND INSTALLATION MEASURES**

Whenever possible, it is advisable to install swinging fire hose reels instead of fixed ones.

The installation must be designed in such a way that any point of the factory can be reached by the water jets of two different fire hose reels when the hose is fully extended. Obstructions such as stored goods, shelving, etc., must be considered when locating hose reels.

### **INSPECTION / TEST / MAINTENANCE**

**Main requirements are at least:**

- Monthly inspection (designated place, no obstruction, pressure gauge reading or indicator in the operable range or position, condition of the hose, ...)
- Annual maintenance by a certified person from a licensed external contractor
- Hose reels must be fully extended once a year to check condition and coverage



### 14.5.3 FIRE HYDRANTS

A fire hydrant allows access to water for the purpose of fighting fires. The water supply may be pressurized, as for hydrants connected to public underground water main or in the industrial area, or unpressurized, as for hydrants connected to nearby ponds or reservoirs.



Example of above-ground fire hydrant



Example of underground fire hydrant

#### **DESIGN AND INSTALLATION MEASURES**

Fire hydrants should be spaced 90 m apart and have to be supplied by a reliable water supply (public network, with or without over-pressure, or private fire water main).

Fire hydrants should be available at the periphery of buildings, a minimum of 12 m away from buildings to be protected.

They should be free of any obstruction and easily accessible for fire fighter use.

When only public fire hydrants are available around the site, it is necessary to contact local public water company or local Fire Department in order to collect data about tests of these hydrants.

#### **INSPECTION / TEST / MAINTENANCE**

**Main requirements are at least:**

- Monthly inspection (designated place, no obstruction, good condition, rubber washers, wheel valves operation, etc.)
- Annual flow test carried out by a certified person or licensed external contractor, with a record of the following information:
  - Static pressure (pressure at each hydrant with no hydrant open) in psi (bar)
  - Residual pressure at each hydrant with one hydrant open on the network in psi (bar)
  - Available water flow in gpm (L/min) at XX psi (bar) by using a Pitot tube
  - Nozzle size (flow hydrant) in (mm)
  - Nozzle coefficient (flow hydrant): 0.9; other



## 14.5.4 FIRE EXTINGUISHERS

A fire extinguisher is used as a first line of fire defence to extinguish or control small fires in emergency situations. Extinguishers are effective only when fires are at their incipient stages.

### RATINGS ON FIRE EXTINGUISHERS

Fire extinguishers are classified by fire type. The A, B, C rating system defines the kinds of burning materials each fire extinguisher is designed to fight. The number in front of the A, B, or C indicates the rating size of fire the unit can extinguish.

**A**

#### “A” TRASH–WOOD–PAPER

Fire extinguishers with a Class A rating are effective against fires involving **paper, wood, textiles, and plastics**. The primary chemical used to fight these fires is monoammonium phosphate, because of its ability to smother fires in these types of materials.

**B**

#### “B” LIQUIDS

Fire extinguishers with a Class B rating are effective against **flammable liquid fires**. These can be fires where cooking liquids, oil, gasoline, kerosene, or paint have become ignited. Two commonly used chemicals are effective in fighting these types of fires. Monoammonium phosphate effectively smothers the fire, while sodium bicarbonate induces a chemical reaction which

**C**

#### “C” ELECTRICAL EQUIPMENT

Fire extinguishers with a Class C rating are suitable for fires in **“live” electrical equipment**. Both monoammonium phosphate and sodium bicarbonate are commonly used to fight this type of fire because of their nonconductive properties.



COLOR CODING FIRE EXTINGUISHERS



DESIGN AND INSTALLATION MEASURES

There should be at least one fire extinguisher per floor area of **200 m<sup>2</sup>** for areas of ordinary combustibility.

The detailed size and number of fire extinguishers shall be governed by local conditions such as the nature of occupancy, the hazards of the area, the construction of the building and its accessibility.

The use of **powder extinguishers** should be **limited** to specific fire hazards, as their discharge agent may cause problems of corrosion and cleaning.

INSPECTION / TEST / MAINTENANCE

Main requirements are at least:

- Weekly inspection (check accessibility)
- Monthly inspection (designated place, no obstruction, pressure gauge reading or indicator in the operable range or position, fullness determined by weighing or hefting for stored pressure type extinguishers)
- Annual maintenance operation by a certified person or licensed external contractor
- Every five years: Discharge and inspect

**Certificates of verification should be delivered after every maintenance operation.**





### 14.5.5 OTHER TYPES OF EXTINGUISHING SYSTEM

Specific automatic extinguishing systems are used for the protection of critical equipment or rooms, such as:

- electrical rooms, data processing centers or premises housing regulation & control cabinets
- fuel tanks
- boilers
- special equipment (oil transformers)

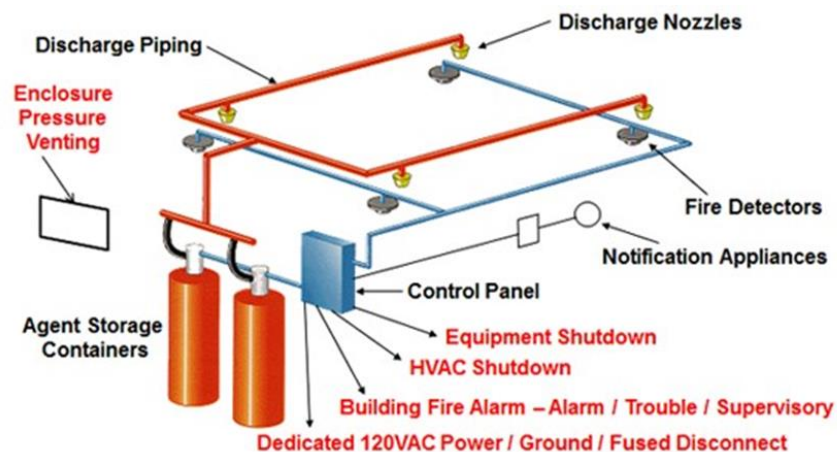
The function of an automatic gaseous suppression system is to extinguish a fire in its earliest stage of development either by reducing the oxygen concentration or by chemically inhibiting the combustion.

The main systems available are:

- automatic gaseous suppression systems
- dry powder extinguishing systems
- water systems (excluding sprinklers) such as:
  - deluge systems
  - foam water extinguishing systems
  - water mist extinguishing systems

#### GAS SUPPRESSION SYSTEM

Automatic gaseous suppression systems are controlled by a fire detection system.



There are three types of fire suppression gases:

- Inert gases (oxygen reduction )
- Carbon dioxide (CO<sub>2</sub> - Oxygen reduction)
- Gases using chemical agents (Flame inhibition)



**INSPECTION / TEST / MAINTENANCE**

To ensure that an automatic gaseous suppression system is fully operational at all time, an appropriate inspection, testing and maintenance program must be implemented.

**This program shall include at least:**

- Regular visual inspections of the room (integrity of the global enclosure, good housekeeping, adequate position of valves) and of the alarm control panel to ensure there are no malfunction in the system
- At least semi-annually, check of the agent quantity and pressure of refillable containers. Depending on the gaseous agent, if a container shows a loss of pressure of more than 5% to 10%, it shall be refilled or replaced
- At least annually, thorough inspection of all systems and functional test by competent personnel or contractor
- Door fan test must be done at least every five years (and after any modification that could impact the room tightness) to verify that the air tightness requirements are met, in order to ensure the efficiency of the fire protection

Hydraulic test of the gas tanks according to local regulation and at least once every ten years.



## 15. ELECTRICITY

Electrical failure is one of the most important ignition sources. Main modes of ignition are presented here below:

- Arcing (externally ionization of air, short circuit or insulation defect)
- Excessive ohmic heating (overload, excessive thermal insulation, ground faults, overvoltage or poor connections)
- External heating

The measures to be taken involve several levels. They are addressed both at personnel in general (controlling the risk, awareness of personnel) and to qualified personnel (procedures associated with electrical equipment, maintenance).

The Head of Safety must be kept constantly informed by the Maintenance Department of any anomalies on electrical installations that might lead to a fire risk, and the corrective action taken.

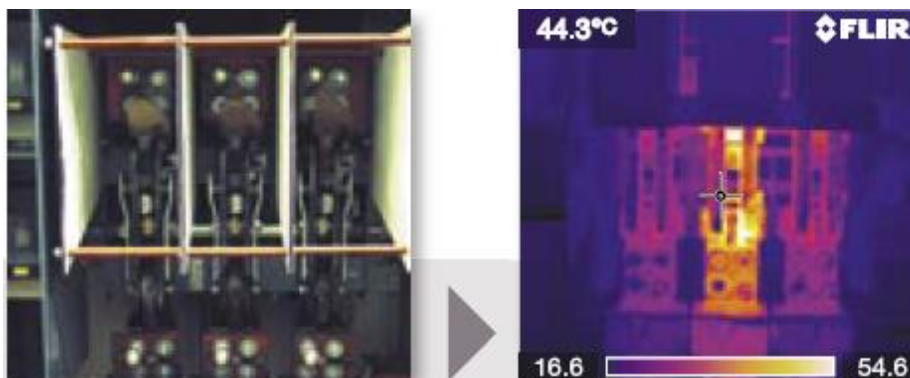
### PERIODIC INSPECTION OF ELECTRICAL INSTALLATIONS

Electrical installations need to be checked **every year** by a specialist. This inspection has to examine low, medium and high voltage. The goal is to check if all standards applied during conception and construction are still observed.

### 15.1 INFRA-RED THERMOGRAPHY

As presented here above, excessive ohmic heating can lead to a fire in electrical cabinets and switchgears. The infra-red thermography inspection is a useful way to identify these ignition risks. This inspection has to be led every year by a specialist, with strong training and a calibrated camera.

The thermal image clearly shows a defect or an overheated fuse. It can have very severe consequences. An entire production line can be shut down for several hours if this problem is not timely fixed.





## 15.2 TRANSFORMER OIL ANALYSIS

Oil type transformers are a critical part of power distribution.

A transformer loss could lead to:

- a business interruption in case of simple break down
- a business interruption and an important property loss in case of fire due to amount of oil

For these two reasons, following analysis has to be occur every year to every 5 years, depending on criticality, load, replacement time, etc...

### ANALYSIS OF WINDINGS AND CELLULOSE PAPER OF TRANSFORMER

Windings are controlled during a dissolved gas analysis made by gas chromatography.

Dissolved gas analysis is used to determine the concentrations of certain gases in the oil such as nitrogen, oxygen, carbon monoxide, carbon dioxide, hydrogen, methane, ethane, ethylene and acetylene.

The concentrations and relative ratios of these gases can be used to diagnose certain operational problems with the transformer.

### ANALYSIS OF INSULATING OIL

Chemical analysis of insulating oil gives an indication of the level of degradation of the oil and so, of the potential problems of the transformer.

Each type of test gives complementary information and permits to refine the diagnostic.

Some of these tests are presented below:

- **DIELECTRIC STRENGTH:**  
The dielectric strength of transformer oil is defined as the maximum voltage that can be applied across the fluid without electrical breakdown.
- **MOISTURE CONTENT:**  
Any increase in moisture content can reduce the insulating properties of the oil, which may result in dielectric breakdown.
- **ACID NUMBER:**  
Just like industrial oils, transformer oils are oxidized under the influence of excessive temperature and oxygen.

Depending on the results of oil analysis, measures to be taken include:

- In case of low degradation of oil characteristics, proceed to a reconditioning of the oil
- In case of medium degradation of oil characteristics, proceed to a regeneration of the oil
- In case of high degradation of oil characteristics, proceed to a global replacement of the oil



### 15.3 EMERGENCY GENERATOR TEST

Diesel generator sets in service shall be tested and run for a minimum of 30 minutes, under operating temperature conditions, at not less than 30 percent of the nameplate kW rating or at the manufacturer's recommended minimum load and every 30 days (30/30/30 rule).

The driver and fuel system should be checked for adequate lubrication and fuel levels as well as fluid leaks. The generator output should be checked for adequate voltage and frequency.

For automatically starting generators, functionally check the operation of the generators by simulating a loss of normal power as well as a return of normal power. If it's not possible every month, auto start has to be checked **minimum once a year**.

### 15.4 BATTERY CHARGING AREAS

Fork lifts can be powered by electricity, diesel or gas. Electric ones have to be reloaded regularly with a specific battery charger.

#### RISK

During loading, hydrogen could be generated. Hydrogen is an easily flammable gas (when present between 4 to 76 % in air) able to generate a fire or a vapor cloud explosion.

Electrical parts can also heat and burn in case of failure.

#### MEASURES TO BE TAKEN

Batteries charging rooms must be:

- Equipped with air inlet at lower level and outlet at upper level, in equal number and dimensions. Hydrogen is lighter than air; its upward speed is around 1 m.s-1.
- under continuous air flow. If forced ventilation is required, fans have to be interlocked with the charging system and have to run during minimum 2 hours after the last charge.
- under hydrogen detection with a first level triggering an alarm (at 10 % of lower explosivity limit) and a second level interlocked with the charging system (at 25 % of lower explosivity limit).
- Crocodile clip have to be avoided.

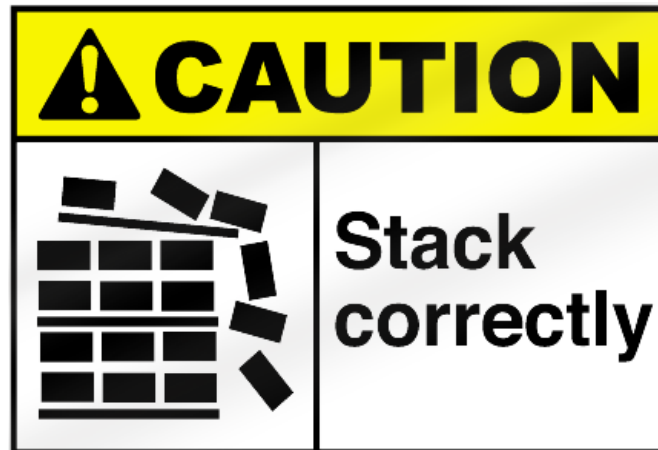
If no dedicated room is available, combustible loads must be kept at 1.5 m of batteries chargers.

Extinguishers adapted for electrical fire (CO<sub>2</sub>) shall be located in the room.



## 16. STORAGE

### 16.1 STORAGE OF FINISHED GOODS



#### RISK

If stacked incorrectly, products, raw materials and other supplies can fall and cause injuries like cuts and bruises or even more serious injuries related to crushing and pinning.

One of the most common accidents related to storage is a stack collapsing. When materials are stacked too high or in an unstable arrangement, removing an item from the stack or bumping the stack can cause the rest of the materials to fall down.

#### MEASURES TO BE TAKEN

**Marking the maximum height** of a pile on a wall or shelving unit can keep piles from growing too high. This can be done with tape, a label or paint, depending on your needs. Making a permanent visual reminder of height limits will help warehouse workers a lot, since they won't need to guess if a pile is too high or get out a tool to measure the height.



## 16.2 STORAGE OF IDLE PALLETS

### RISK

The configuration of a pallet or pallet stack, with a large area of internal flue space, contributes to increase the intensity of a fire due to large amount of oxygen. The undersides of the pallets create a dry area on which a fire can grow and expand.

### MEASURES TO BE TAKEN

#### INDOOR STORAGE

- In a low value building located at least 10 m from other buildings
- Idle pallets in manufacturing areas should be limited to the **minimum**
- Automatic sprinkler protection following a recognized standard (NFPA 13 standard, APSAD R1 for example) should be provided for **all indoor pallet storage. The distance between the pallets and sprinklers heads should be at least of 45 cm.**

**If sprinkler protection cannot be provided, following rules should be applied:**

**Wood pallets** should be kept in single stacks limited to **1.5 m in height** and should be kept at least **1.5 m from other combustible material and machinery.**

**Plastic pallets** should be kept in single stacks limited to **1 m in height** and should be kept at least **3 m from other combustible material and machinery.**

- Each location of idle pallets in plants should be:
  - clearly defined
  - marked
  - accessible for fire intervention
  - be free of any other combustible material, liquid storage or ignition source

#### OUTDOOR STORAGE

- Idle pallet stacks shall not exceed 4.5 m in height nor shall cover an area of greater than 40m<sup>2</sup>
- Distance between pallets should be of 10 m (increase to 13.5 for wood pallets / 22.5 plastic pallet if there are more than 200 pallets)
- Moreover, to minimize arson exposure, the idle pallets storage areas should be kept away from the site's outside fence, with a minimum distance of 3 m when possible.

When the safe distances listed before cannot be respected, the following general rules must at least be adhered to:

- reduce the quantity of pallets
- reduce the height of the stack of pallets and separate in many small stacks
- place the pallets storages against a fire-resistant wall or non-combustible
- place pallets storages away from site's fence and away from potential ignition sources



## 16.3 STORAGE TANK SYSTEMS

Bata Companies have to ensure that both their underground and aboveground storage tanks are installed, operated and maintained in an environmentally sound manner.

### 16.3.1 UNDERGROUND STORAGE TANK (UST) LEAK PROCEDURE

The EH&S Coordinator and other personnel, as well as the applicable regulatory authority should be notified immediately when leaks or discharges occur.

Leak detection methods should be employed as part of the operational and maintenance procedures (see chapter 16.3.7).

**Leaks or accidental discharges may be indicated by any one of the following:**

- Unusual operating conditions (such as erratic behavior of the dispensing pump)
- Any unexplained loss of product as indicated by the recording and reconciliation of inventory records
- If water is detected at the bottom of a UST
- Results from leak detection monitoring and testing that indicate a leak (Do Not Ignore Equipment Alarms)
- Evidence of environmental damage on site – odors, staining, vegetation decay, etc.

When a leak has been confirmed the following short-term and long-term actions, in addition to those outlined in the Spill Prevention and Control Plan (*Chapter 34 – Emergency Planning & Response*), should occur:

#### **SHORT TERM:**

Take immediate action to stop and contain the leak or spill. Leaking UST systems should be immediately pumped and emptied. Notify the relevant internal company and external contacts.

Ensure that the leak or spill presents no hazard to human health and safety by removing explosive vapors and fire hazards. Contact local fire department for assistance if required.

#### **LONG TERM:**

Long term activity, including tank removal, system upgrade and site remediation are the responsibility of the EH&S Committee.

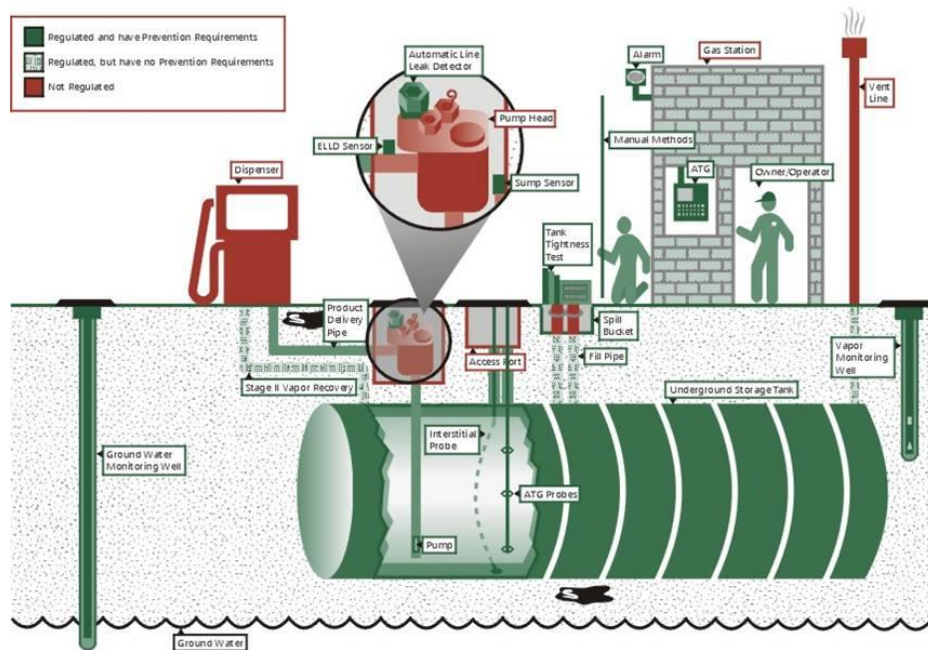




### 16.3.2 REGISTRATION

New and existing Underground Storage Tanks (USTs) may have to be registered with the “authority having jurisdiction”.

#### Underground Storage Tank Release Detection



### 16.3.3 SITE CLASSIFICATION

The following methods may be used to classify sites

- Consult with the “authority having jurisdiction”.
- Have an environmental consultant evaluate local geological criteria: proximity to wells, bodies of water or wetlands; population density and presence of sub-surface utility corridors. This method should be employed only if there are no provisions in legislation or regulations for site sensitivity classification.
- The consultant should also assess the corrosiveness and aggressiveness of the ambient soil or other characteristics that could affect the useful life and integrity of the storage tank system, and therefore require more extensive protection.
- Assume the facility is a sensitive site in the absence of applicable legislation or regulations and if a site sensitivity assessment study has not been conducted.



### 16.3.4 DESIGN AND INSTALLATION OF NEW UST SYSTEMS

Because USTs are generally costlier to install and maintain properly, and carry a high potential for causing environmental damage, it is recommended that Aboveground Storage Tanks (ASTs) be selected for new installations.

**USTs should only be installed where extreme space restrictions or other factors are present.**

**The following steps must be followed prior to installing new UST systems:**

- **Approval** for the UST system should be obtained from the “**authority having jurisdiction**”.
- Only **licensed and experienced contractors** should be used for any new installation or modification of existing installations.
- Storage tanks should be located to permit eventual removal when withdrawn from service.
- **Fiberglass Reinforced Plastic (FRP)**, providing it is compatible with the chemicals being stored is the preferred material of construction for the UST.
- All steel USTs and associated piping should be provided with corrosion protection in conformance with current standards and other recognized guidelines. The corrosion protection system shall be certified in writing by the installer who should verify the measured voltage potentials and acceptable cathodic protection.
- A new storage tank, when added to an existing system that is already protected by an impressed current cathodic protection system should be of the **same design** and shall be **electrically bonded into the impressed current cathodic protection system** and have **anodes** to protect it.
- Impressed current cathodic protection should be interlocked in such a manner that if the cathodic protection system is turned off or bypassed, either the power to the pump will be shut off or audible and visual alarms will be turned on.
- Cathodically protected tanks should be installed with either test wires brought to the surface and fastened at an accessible location or a zinc reference electrode and monitoring station.
- Leak detection devices and overfill protection must be built into the design, and dispensing must be through a metering device to facilitate adequate inventory controls.
- **Certified leak detection devices and methods should be used.** Leak detection can be provided by one of the following methods:
  - Groundwater monitoring wells
  - Vapor monitoring systems
  - Vacuum monitoring (at least 300 mm Hg) of Interstitial space of a storage tank
  - Inventory controls



### 16.3.5 EXISTING UST SYSTEMS

The following guidelines apply to existing USTs:

All unprotected steel tanks should be upgraded or removed from service.

#### Upgrading of UST systems should include:

- Replacement of tanks and piping systems
- Installation of an impressed cathodic protection system (designed and installed in conformance with acceptable standards)
- Addition of sacrificial anodes in accordance with accepted standards

#### All UST systems should be provided with the following additions:

- Overfill device shall be added to the storage tank
- Spill containment device added to the fill pipe
- **Dispenser sump** should be added beneath the dispenser whenever the product supply piping or pump islands are replaced or relocated
- **Liquid- and vapor-tight connection** should be installed on all fill pipes

### 16.3.6 REMOVAL OF UST SYSTEMS

**USTs which are no longer in service must be removed from the ground** unless it is impossible to do so. Those which must be left are to be purged and filled with an inert material. In all cases, removal or abandonment must be done in accordance with applicable regulations or guidelines.

UST removal must be done only by approved/recognized, experienced contractors. The material below the tank and piping is to be sampled and analysed for contamination by an approved contractor. If it is determined to be hazardous, it is to be excavated to an allowable “clean” depth and disposed of in accordance with acceptable waste management procedures.



### 16.3.7 OPERATIONAL AND MAINTENANCE GUIDELINES

The following operational and maintenance guidelines apply to all storage tank systems. It should be ensured that:

- **The product level** in a UST is measured and reconciled:
  - Each day that product is added or removed from the storage tank
  - At least weekly where product is added or removed on a less frequent basis
- **Storage tank inventory control measurements** should be reconciled by comparing product and levels with dispenser meter readings, deliveries, and internal transfers. The computation of any gain or loss of product shall be recorded and included with a monthly summary of cumulative losses or gains of product.
- **Inventory control records and reconciliation data** should be Maintained on site and retained for at least **two years**.
- **Maintenance checks** on the operation of **cathodic protection systems** should be conducted as required by the “authority having jurisdiction” and in conformance with current standards.
- **Cathodic protection measurements** for all sacrificial anode protected USTs should be conducted at least annually in accordance with accepted standards.
- As a minimum requirement, **tightness testing of new tank and piping systems** is to be done at least every **5 years**.

USTs over 10 years are to be tested every **2 years** and those over 15 years are to be tested **annually**.

Air or nitrogen is not to be used to test USTs.

- All **electronic or mechanical leak detection equipment** should be inspected and tested for satisfactory operation at least annually in conformance with the manufacturer’s instructions.

Maintain records for all the following for a period of at least **five years**:

- Cathodic protection measurements
  - Impressed current system checks
  - Line leak detection system checks
  - Leak detection equipment tests and checks
  - Precision leak test results
  - Excavation or nearby construction that could affect the integrity of the storage tank system
  - Inspections, tests, or maintenance checks of UST systems
  - Installation of an internal lining
- Records of all alterations and upgrading of a UST should be maintained for the **life of the storage tank**.



### 16.3.8 ABOVEGROUND STORAGE TANKS

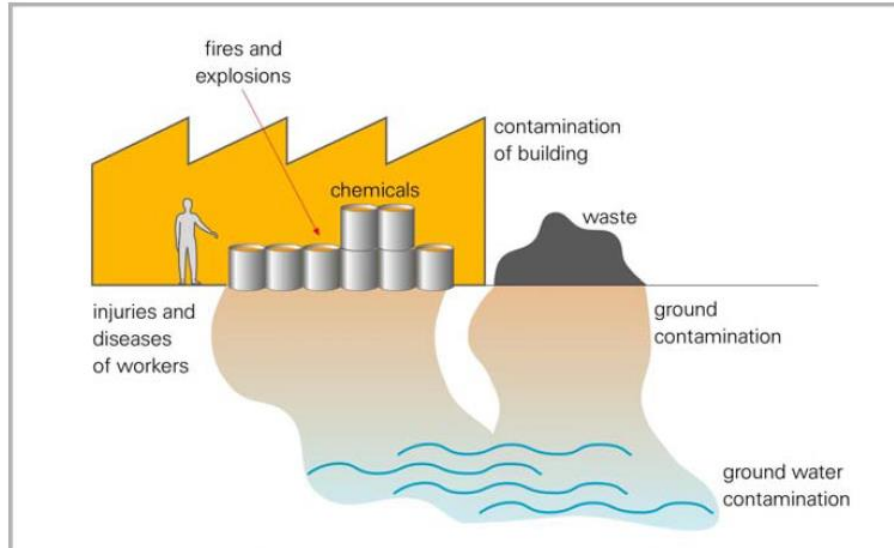
The following Guidelines apply to aboveground storage tanks (ASTs) whether inside or outside a building:

- Containment, in the form of impervious material such as concrete is to be installed around the ASTs in a manner that it will contain at least 110% of the tank's volume. If the tank is outdoors, it must have the provision for collecting rain water in a sump, and necessary removal will be by means of a manual or portable pump. Valves are not to be installed in the containment walls and there must not be any breaches in the containment enclosure.
- Piping, control valves, and pumps are to be located within the containment area. If they continue to the point of use, all means practical should be taken to ensure continuous containment.
- Overfill protection should be provided in the form of high level alarms. If these are not present, gauges should be provided to clearly identify liquid levels. When tanks are being filled, an attendant must be present for the duration of the filling and disconnection of the delivery truck. At no time will this operation be unattended. A check valve should be installed on the fill line to minimize the potential for backflow.
- Fiberglass Reinforced storage tanks must be protected inside a containment enclosure to ensure that fork lift forks cannot touch the wall of the tank under any circumstance. A barrier outside the containment enclosure to prevent fork lift vehicles becoming too close to the storage tank is required.
- Tank replacement must be undertaken as required by the authority having jurisdiction issues specific requirements regarding the maximum age of a AST; licensed environmental consultants should advise on the recommended age for the replacement of an AST where no regulatory authority issues specific requirements.
- Tanks are to be regularly inspected to observe signs of corrosion, settlement, wall deformation, and signs of leakage. Hydrostatic testing is recommended every 10 years.



## 16.4 STORAGE OF CHEMICAL PRODUCTS

Chemicals present a variety of hazards and proper storage is necessary to minimize the risk of fire, explosion, serious personal injury and environmental contamination.



*Possible Impacts and Risks from Chemical Storage*

### 16.4.1 FLAMMABLE AND COMBUSTIBLE PRODUCTS

Flammable liquids are those generating a vapour layer easily ignitable above liquid at ambient temperatures.

Combustible liquids need to be heated to create a similar vapour layer.

#### Example of flammable Liquids

CLASS	FLASHPOINT	BOILING POINT	EXAMPLES
Class IA	<22,8°C	<37,8°C	Ethyl ether, heptane, pentane, propylene oxide, vinyl chloride
Class IB	<22,8°C	≥ 37,8°C	Acetone, ethanol, gasoline, isopropyl alcohol, methanol, methyl ethyl ketone, octane, toluene
Class IC	≥ 22,8°C and <37,8°C	All boiling points	Isobutyl alcohol, mineral spirits, styrene monomer, turpentine, xylene, spirit of turpentine, Trichloéthylène, White Spirit

### Examples of combustible liquids

CLASS	FLASHPOINT	EXAMPLES
Class II	$\geq 37.8^{\circ}\text{C}$ and $< 60^{\circ}\text{C}$	Diesel fuel, fuel oil, kerosene, motor oil
Class IIIA	$\geq 60^{\circ}\text{C}$ and $< 93^{\circ}\text{C}$	Furfural, linseed oil, mineral oil, oil based paints
Class IIIB	$\geq 93^{\circ}\text{C}$	Ethylene glycol, glycerine, neatsfoot oil

### RISK

Flammable and combustible liquids can burn and create a pool fire. This pool fire can propagate the fire to an important area, only limited by a slope or drainage.

### MEASURES TO BE TAKEN

Ignition sources have to be kept away from all flammable and combustible storage. Ignition can be hot work, static electricity or smokers for example.

To avoid static electricity, all conductive materials in contact with flammable liquids have to be grounded and conductive materials, isolated by polymer connection or gasket, have to be bounded.

#### **All packaged flammable and combustible liquids have to be:**

- stored above a retention area to avoid pool creation in case of leakage. This retention has to be in incombustible material and capacity is expected sufficient for the biggest stored volume
- well labeled
- supported by a safety data sheet
- stored away from the lifts, exits or main corridors that lead to exits
- stored away from oxidizers (e.g.: nitrates)

#### **All packaged flammable products have to be:**

- stored in a locked and ventilated dedicated premise to avoid vapors concentrations
- stored in premises with explosion proof electrical installation

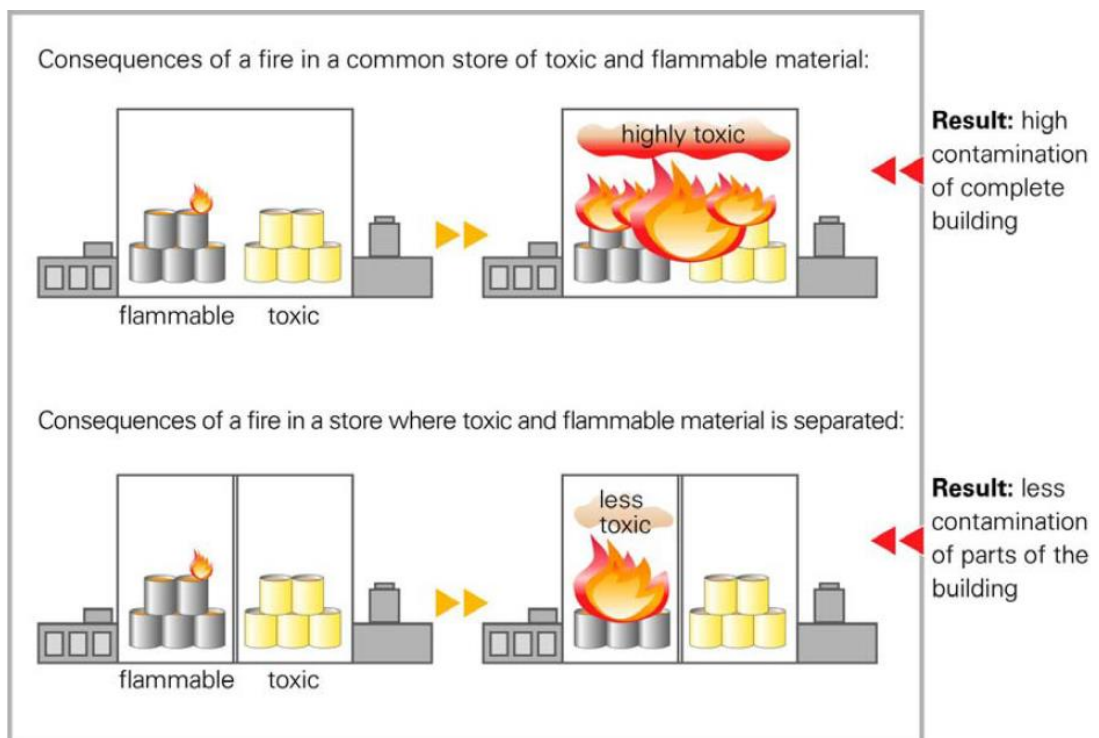


### 16.4.2 STORAGE SEPARATION

To minimize the potential impact of chemical leaks and spills, and the possible consequences of fires in chemical storage areas, it is important that incompatible chemical materials be stored with adequate separation.

The following precautions should be taken:

- Chemicals that are oxidizers or oxidizing agents should be kept away from flammable liquid storage.
- Toxic but non-flammable chemicals, that may form even more highly toxic chemicals during combustion, should be stored away from flammable liquids.
- Chemicals that may react with each other should be stored remotely from each other.
- Water-reactive chemicals should be stored separately from water-based (aqueous) chemicals.



*Storage of Compatible Chemicals*





## 17. SPECIAL HAZARDS

### 17.1 OZONE DEPLETING SUBSTANCES

It is the policy of Bata to minimize emissions of Ozone Depleting Substances (ODS) and to maximize recycling with the goal of zero emissions of ODS. Bata Companies must comply with all applicable government laws and regulations relating to ODS.

ODS's may also be used in Bata Companies as mould release agents and in propellants used for various purposes in the footwear assembly area. Although the emphasis is on ODS's used as refrigerants, the Bata Guidelines are also applicable to the manufacturing operations.



#### **BACKGROUND**

There has been a dramatic increase in the depletion of the ozone layer caused by the increased use of ozone depleting substances and, specifically, by their release into the atmosphere.

The main ozone depleting substances are CFCs (chlorofluorocarbons), HCFCs (hydro chlorofluorocarbons), HBFCs (hydrobromofluorocarbons), halons, methyl bromide, methyl chloroform and carbon tetrachloride.

#### **MANAGING CFC REFRIGERANTS**

There are three possible courses of action that can form the basis of a CFC/HCFC refrigerant management plan, namely:

- Containment and conservation of CFC/HCFC refrigerants
- Conversion of CFC/HCFC refrigerants in existing equipment, to alternative refrigerants
- Replacement of existing air conditioning and refrigeration equipment

#### **GENERAL GUIDELINES**

Equipment which uses CFCs, HCFCs or halons must only be serviced by a qualified technician. Under legislation and regulations in most countries, business managers seeking environmental authorisations must ensure that any technicians hired to service equipment containing ozone depleting substances are qualified according to the requirements in the authorisation. It is generally illegal to deliberately release CFCs, HCFCs or Halons into the atmosphere except under prescribed circumstances, such as for extinguishing fires.



The most commonly used ozone depleting substances have been CFCs, HCFCs and halons. The main areas of use are:

- **REFRIGERATION AND AIR-CONDITIONING**

Many air conditioning and refrigeration units, including car air-conditioners use CFCs. The manufacture and import of CFCs is banned in most countries and CFCs are becoming increasingly scarce.

If you own equipment which uses CFCs, you should consider retrofitting the equipment to use other, less harmful, substances.

- **FIRE EXTINGUISHING EQUIPMENT**

Halons, which are extremely harmful to the ozone layer, were used extensively in fire extinguishing equipment. In some jurisdictions it has become illegal to possess halon fire extinguishing equipment, including yellow (BCF) portable fire extinguishers, without special permission.

It is unacceptable (and illegal) to vent unwanted ozone substances to the atmosphere. Unwanted ozone depleting substances and equipment containing these substances can be disposed of as indicated in the following table.

<b>BCF fire extinguishers</b>	Must be handed to fire brigade as it is may be illegal to keep BCF fire extinguishers unless they are used in aircraft or you have an authorization.
<b>CFCs or HCFCs</b>	Return to suppliers directly or through other collection programs.
<b>Refrigeration units</b>	An authorized refrigeration mechanic must drain the refrigerant before disposal to landfill.
<b>Halons</b>	Refer to local programs and regulations.
<b>Vehicle air-conditioners</b>	An authorized refrigeration mechanic must remove the refrigerant before disposal. If disposing of the air conditioner at a wrecker, ask the wrecker to organize for a mechanic to remove it for you.



## 17.2 ASBESTOS

Asbestos is a generic term that applies to naturally occurring mineral silicates that are separable into flexible, incombustible fibres. Asbestos has been used for:

- ceiling and floor tiles
- pipe insulation
- cement and insulating materials
- cement construction materials (roofing shingles and cement pipes)
- friction materials (brakes linings and clutch pads)
- venting and gaskets
- asphalt coats and sealants

**Asbestos-containing materials (ACM) can be grouped into three categories:**

- 1** Sprayed or trowelled on materials on ceilings, walls and other surfaces;
- 2** Insulation on pipes, tanks, ducts and other equipment;
- 3** Other miscellaneous products.

Materials in the first two categories can be crumbled, pulverized, or reduced to powder by hand pressure and are commonly referred to as “friable materials”.

Friable Materials are more likely to release fibres when disturbed or damaged. Nonfriable materials will also release fibres when cut, drilled, sanded or broken during building renovations or repairs.

The inhalation of asbestos fibres has been shown to produce asbestosis, lung cancer, and mesothelioma (a cancer of the lining of the lung and chest cavities).

### **REMOVAL VERSUS MANAGEMENT**

The following information should be considered in deciding between Asbestos Removal and Management:

- ACM does not spontaneously shed fibers, but physical damage by decay, renovation, or demolition can lead to release of airborne fibers.
- Improper removal of previously undamaged or encapsulated asbestos can lead to increases in airborne concentrations of fibers in buildings, sometimes for months afterwards, and can result in problems with safe removal and disposal.
- Recent publications stress that chrysotile asbestos (which predominates in buildings) is not nearly so dangerous as other forms of asbestos.



**GUIDELINES**

Buildings heated with hot water or steam built before 1960 probably will have asbestos insulation on the piping system. Disused systems are particularly vulnerable as there may not have been any ongoing maintenance on the insulation and as a result the asbestos covering may have become damaged allowing the asbestos to shed fibers.

**EACH COMPANY SHOULD:**

<p><b>DETERMINE IF ACM IS PRESENT</b></p>	<p><b>IDENTIFY ACM IN RECORDS BY TYPE</b></p>	<p><b>INSPECT</b></p>
<ul style="list-style-type: none"> <li>• Review Building Records by checking original plans, shop drawings, renovation records and work change orders</li> </ul>	<ul style="list-style-type: none"> <li>• Sprayed or troweled on surfacing material;</li> <li>• Pipe and boiler insulation;</li> <li>• Other miscellaneous ACM.</li> </ul>	<ul style="list-style-type: none"> <li>• All buildings identified through record search should be inspected as indicated below.</li> </ul>

**If the facility has been identified as having ACM or if asbestos is suspected of being present, the following actions can be taken:**

- Samples of the ACM should be taken (visual inspection is unreliable).
- Licensed specialist contractors must be engaged to undertake any removal of asbestos to determine if a friable material contains asbestos.
- Type of asbestos present should be identified (i.e. friable or nonfriable).
- Indoor air monitoring should be conducted.
- If levels are unacceptable then a detailed assessment of physical damage to ACM should be conducted by experienced personnel or external consultant.
- Repair and/or encapsulate damaged areas.
- If conditions warrant that the ACM be removed, licensed trained individuals should be employed and the material disposed of according to applicable waste management regulations.
- Before stripping, the asbestos should be wetted to suppress dust.
- Individuals involved in the removal must wear appropriate protective clothing including respirator, coveralls and gloves.
- Inspection should be conducted on all ACM for damage or deterioration at least once per year. Findings should be reported to the Country Manager.



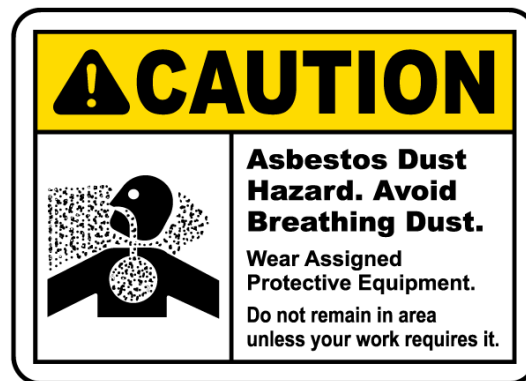
**MANAGEMENT OF ASBESTOS WASTE:**

The management of asbestos waste must be carried out according to legal provisions, and every precaution must be taken to prevent the asbestos waste from becoming airborne.

Safe containment, packaging, labelling and transporting requirements must be followed including codes of practices, regulations, and local guidelines.

**Even trivial quantities of asbestos dust can be harmful and lead to a disease, mesothelioma which can be fatal to employees exposed to the dust.** Blue asbestos is thought to be the most likely type of asbestos causing mesothelioma and extreme care is necessary to protect employees and other persons who could come into contact with asbestos dust.

Only licenced contractors authorized to handle asbestos should be allowed to undertake any work involving the removal, modification of equipment containing asbestos or any other work which exposes asbestos to the atmosphere.





## 18. HAZARD COMMUNICATION AND CLASSIFICATION

### 18.1 HAZARD COMMUNICATION

The objectives of the Hazard Communication Guidelines are to:

- Identify all hazardous substances used in the company.
- Obtain labels and Material Safety Data Sheets (“MSDS’s”) prior to use of hazardous substances in the workplace.
- Prepare labels to affix to company containers, storage bins, and receptacles.
- Implement safe work procedures and proper controls.
- Educate workers about chemical hazards, labels, MSDS’s and safe handling procedures.

### 18.2 HAZARD DETERMINATION & CLASSIFICATION

A product is generally considered hazardous if it meets the criteria of one or more hazard classes. The hazard classes are:

<b>Class A:</b>	<b>Compressed Gases</b>
<b>Class B:</b>	<b>Flammable &amp; Combustible Materials</b>
	Division I: Flammable Gases
	Division II: Flammable Liquids
	Division III: Combustible Liquids
	Division IV: Flammable Solids
	Division V: Flammable Aerosols
	Division VI: Reactive Flammable Materials
<b>Class C:</b>	<b>Oxidizing Material</b>
<b>Class D:</b>	<b>Poisonous &amp; Infectious Material</b>
	Division I: Materials Causing Immediate & Serious Toxic Effects
	Subdivision A: Very Toxic Material
	Subdivision B: Toxic Material
	Division II: Materials Causing Other Toxic Effects
	Subdivision A: Very Toxic Material
	Subdivision B: Toxic Material
<b>Class E:</b>	<b>Corrosive Material</b>
<b>Class F:</b>	<b>Dangerously Reactive Material</b>



## 18.3 WRITTEN HAZARD COMMUNICATION PROGRAM

The written program must indicate, by position or name, the individual(s) who will oversee the program with regard to maintenance of MSDS's, labelling of chemical containers and employee training.

The chemical inventory should be included and the written program should specify how employees will be trained as well as how contractors will be advised of any hazards.

### 18.3.1 INVENTORIES

The objectives of an inventory are to locate, identify, and obtain information on all substances on the premises and reveal where and how materials are being used and in what quantities.

Each Department manager will compile the initial inventory list and forward it to the EH&S Coordinator and take an active role in ensuring that the inventory list is kept up to date.

**At the time of the initial inventory, and periodically thereafter, a survey of the materials should be made to determine:**

- Which materials are obsolete and should be disposed of
- Which hazardous materials could be substituted for other less hazardous materials
- If the material is needed at all or could be ordered in smaller quantities

### 18.3.2 PURCHASING PROCEDURES

The Hazard Communication Program requires effective liaison with suppliers of hazardous or potentially hazardous materials.

**The Purchasing Manager should follow the procedures listed below:**

- An up to date inventory list for all Departments should be maintained indicating whether or not materials are controlled products.
- Controlled products must have an up to date MSDS. Where one does not exist, no further purchases are to be accepted until such time as the supplier provides the appropriate MSDS.
- All incoming shipments of chemical products should be quarantined until such time as MSDS's are verified, labels are checked, and workplace labels are applied as required.
- When classification is in doubt, the Purchasing Manager should obtain confirmation, preferably in writing, from the supplier.



### 18.3.3 LABELS & WARNINGS

A controlled product cannot be used in the company unless the container in which the product is packaged is clearly labelled. This label may be one provided by the supplier of the controlled product (supplier label) or one affixed to the container of the company (workplace label). Supplier labels must be written in the official languages of the user’s country.

**Information that should be included on a supplier label includes the following:**

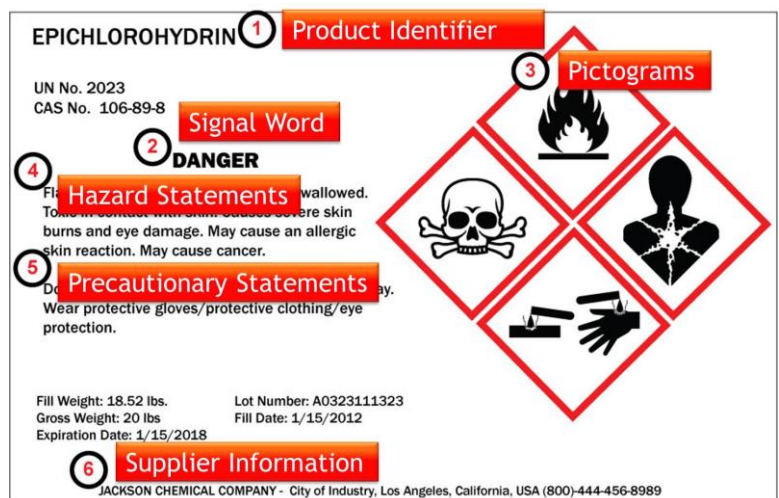


#### THE PRODUCT IDENTIFIER

The brand name, code name, or code number given to the product by a supplier or the chemical name, common name, generic name or trade name.

#### THE SUPPLIER IDENTIFIER

The name of the manufacturer or importer of the product.







### 18.3.4 COLOUR CODING / LABELLING

Any signs that include working should use the language appropriate for the workers.

**The following precautions and criteria apply:**


































- Signs and notices should be appropriate in number
- Signs and notices should be displayed clearly
- Signs and notices that are obsolete should be removed immediately
- Signs should be large enough to be clearly legible
- Signs should be of robust construction, corrosion and weather-resistant, and be readily fixed to their intended location
- Essential signs should be illuminated so they are visible when it is dark, foggy or there is smoke
- Signs and notices should be properly maintained, replaced and/or cleaned as necessary

**Workplace Labels** - Under certain circumstances, the company should generate its own labels. Specifically, a workplace label is needed when the product is poured into smaller containers to be taken to their point of use.

Information on the workplace label is intended to convey basic necessary information such as:

- The product identifier
- Information on the safe handling of the material
- A statement that an MSDS is available



Safety Colour	Shape	Meaning/ Purpose	Example
Red Border Black Symbols White Back-ground	Round	Stop / Prohibition	 no fire  no drinking water  no smoking  do not extinguish with water  pedestrians prohibited
Black Border Yellow Back-ground Black Symbols	Triangular	Caution / Warning of Danger	Signs for areas:  corrosive substance  risk of fire  gas cylinder  risk of electrical shock  toxic hazard
Black Border Orange Back-ground Black Symbols	Square	Caution / Warning of Danger	Labels on chemicals:  corrosive substance  harmful substance  irritant substance  toxic substance  high toxic substance  flammable substance  highly flammable substance  environmental hazard
Blue (Border and Background) White Symbols	Round	Mandatory Action	 wear eye protection  chain cylinders  wear ear protection  wear light breathing equipment  wear gloves  wear head protection  wear foot protection  drinking water
Green (Border and Background) White Symbols	Square	Safety Facilities	 doctor  eye wash facility  first aid  emergency shower  emergency telephone  exit direction  exit direction  assembly area
Red (Border and Background) White Symbols	Square	Fire Protection	 extinguisher  fire hose  ladder



### 18.3.5 MATERIAL SAFETY DATA SHEETS



The MSDS's will detail the proper handling and storage procedures that must be passed on to employees during training programs and the need to develop other engineering or administrative controls which could be used to minimize employee exposure to hazardous material.

MSDS's must be provided by the manufacturer for each material, and likewise the company is required to have an MSDS for each hazardous material used. These are to be stored in a master binder, with copies readily available and accessible to employees.

In order to provide uniformity and consistency of MSDSs throughout the world, the International Organization for Standardization (ISO), has decreed the following sixteen (16) sections of information be required for disclosure on an MSDS

#### **Section 1. Chemical Product and company Identification:**

- The identity of the chemical which is used on the label
- Name, address and telephone number of the chemical manufacturer, importer or other responsible party
- The date of preparation of the MSDS, and/or date of the last revision
- Emergency phone number of manufacturer or of official advisory body

#### **Section 2. Composition, Information of Ingredients:**

- The chemical (or common) names and concentrations of all ingredients determined to present a health hazard in the mixture (hazardous ingredients comprising more than 1% of the total composition)
- Any risk phrases

#### **Section 3. Hazards Identification:**

- List most important hazards
- List adverse human health effects and symptoms

#### **Section 4. First Aid Measures:**

- List first aid procedures, subdivided according to route of exposure
- Indicate if a doctor is needed



**Section 5. Fire Fighting Measures:**

- List extinguishing media, and media to be avoided
- List special exposure hazards for chemical, combustion products, or gases
- List special protective equipment for fire-fighters

**Section 6. Accidental Release Measures:**

- Personal precautions
- Environmental precautions
- Procedures for clean-up and disposal of spills or leaks
- List of prohibited materials

**Section 7. Handling and Storage:**

- Any generally acceptable precautions for safe handling and use
- General ventilation requirements
- Conditions for safe storage
- Identification of incompatible materials
- Special packaging materials

**Section 8. Exposure Controls and Personal Protection:**

- Full range of precautionary measures
- Engineering controls, or practices that should be used
- Permissible exposure limits (exposure limits set out in regulations or as recommended by the manufacturer or supplier)
- Listing of equipment needed for personal protection

**Section 9. Physical and Chemical Properties:**

- |  |   |
|--|---|
| <ul style="list-style-type: none"><li>• Appearance and odor</li><li>• pH</li><li>• Boiling point</li><li>• Melting point</li><li>• Flash point</li><li>• Flammability</li><li>• Explosive properties</li></ul> | <ul style="list-style-type: none"><li>• Vapor pressure</li><li>• Water and fat (solvent) solubility</li><li>• Relative density</li><li>• Evaporation rate</li><li>• Partition coefficient</li></ul> |
|--|---|

**Section 11. Toxicological Information:**

- Primary routes of entry into the body
- Dangerous health effects from exposure, subdivided according to route of entry
- Known delayed effects (including whether the material is a known or suspected carcinogen, mutagen, teratogen or reproductive toxin)



**Section 12. Ecological Information:**

- Assessment of the possible effects and environmental impacts
- List ecological characteristics (mobility, persistence, degradability, bioaccumulative potential, aquatic toxicity, etc.)

**Section 13. Disposal Considerations:**

- If disposal presents a danger, a list of safe handling information
- Methods of disposal for both the material and any contaminated packaging (recycling, incineration, landfill, etc.)

**Section 14. Transportation Information:**

- Special precautions to comply with transporting material
- Classification to International Dangerous Goods Regulations

**Section 15. Regulatory Information:**

- Information relating to the hazard classification of material (i.e. Controlled Products Regulations in Canada (WHMIS), Toxic Substances Control Act in the United States, Control of Substances Hazardous to Health in the United Kingdom, etc.)

**Section 16. Other Information:**

- Any other information that might be of importance for safety and health
- Manufacturer or supplier disclaimer



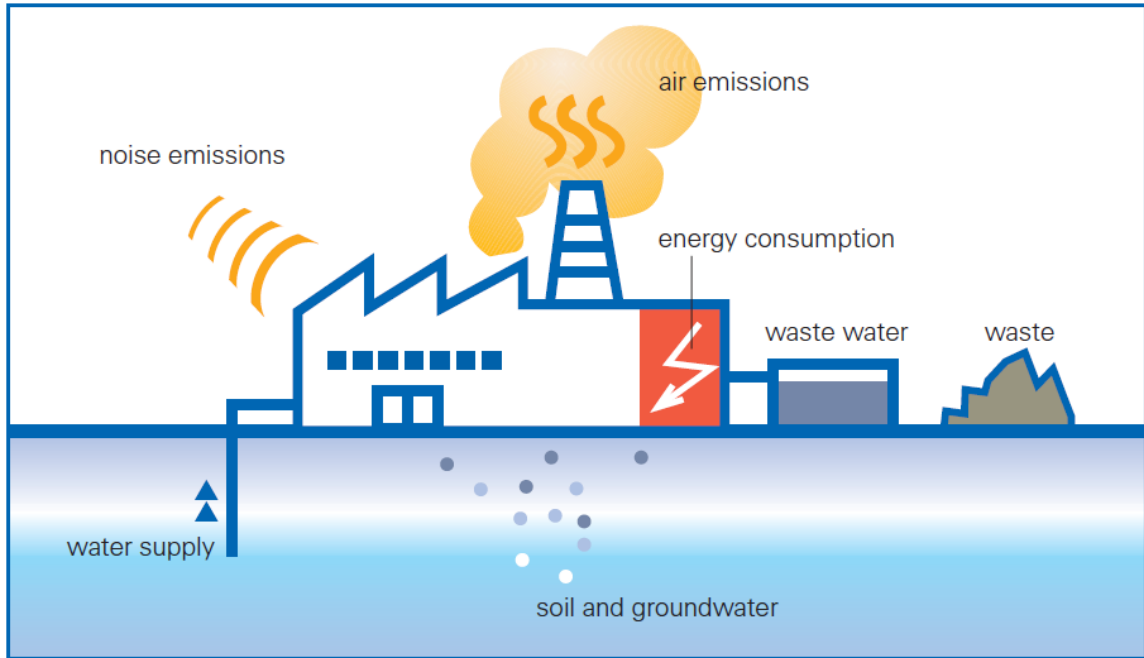
## SECTION 5 - ENVIRONMENT





**ENVIRONMENT CHAPTERS**

In a production setting, industrial activities can affect the environment in different ways. The most important environmental impacts on site are shown in the following illustration.



Recommendations for improving the environmental impact described are given in the following chapters of this section.



19. **BUILDING**



20. **ENERGY**



21. **WASTE MANAGEMENT**



22. **WATER**



23. **EMISSIONS**



24. **NATURAL HAZARDS**



## 19. BUILDING

The objective is to design, construct and operate an aesthetic building which meets all the occupants' needs while performing at optimum levels of efficiency (increasing environmental performance and reducing operational costs).

A "green" building design must address many factors, including air quality, energy efficiency, and the application of green materials. To help reduce environmental impacts, a set of guidelines is listed below to facilitate the development of "green" buildings.

### HOW IMPROVEMENTS CAN BE MADE

#### SITE SEARCH

- When choosing your building land, consider economic operation (e.g. passive solar design and the use of natural lighting) as well as logistical connections to reduce transport, its emissions and costs
- Protect and retain existing landscaping and natural features
- When buying land for enlargement of the site, consider past land contamination

#### BUILDING WORK

- If a reconstruction of the building is planned, discuss this as early as possible with designers, construction contractors and other companies involved to explore project options collaboratively, for example, how to supply compressed air; include recovery of heat or cold, etc.
- If a completely new building is planned, consider the use of geothermal energy exchange (precooling in hot season; preheating in cold season)

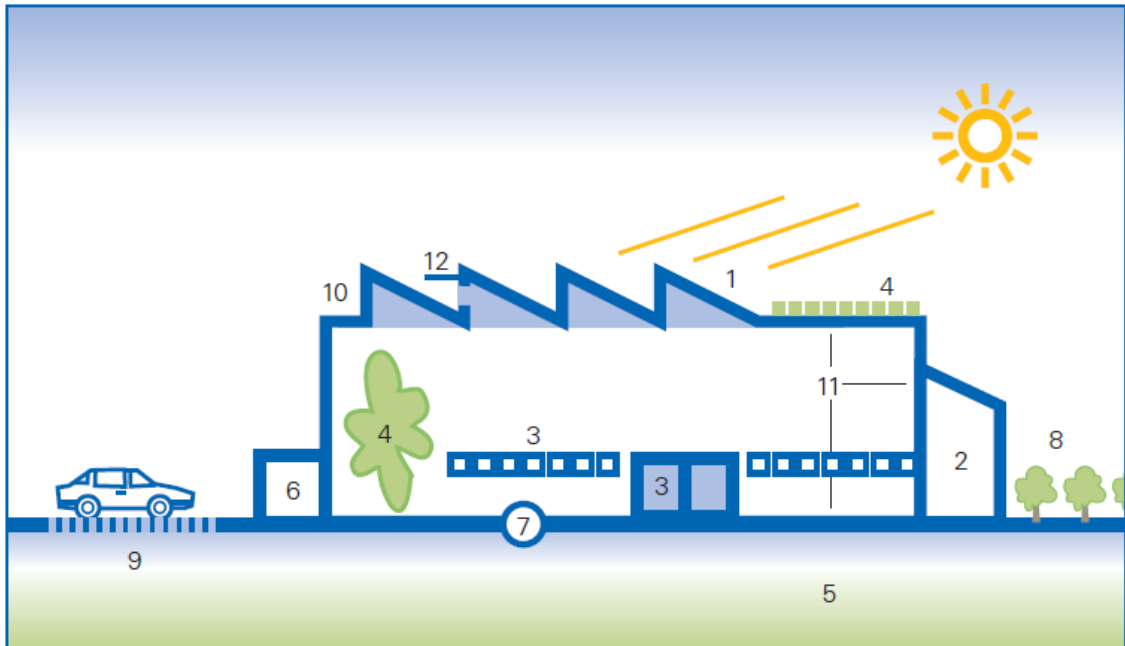
#### EXTERNAL AREAS

- Select plants that have lower water and pesticide needs, and which generate fewer plant trimmings
- Green facades and roofs display the ecological awareness of a company in a pleasant way; in addition to the aesthetic value, green roofs and facades have a positive effect on the heat insulation of a building and can promote soundproofing
- Use cheap and water permeable pebbles, sand, turf, turf bricks and turf paving for entry roads, parking spaces and footpaths to avoid negative effects on ground water balance





**THE ECO FRIENDLY INDUSTRIAL BUILDING**



1. Sunny side of the shed roof for solar energy use
2. Sunny side with glass surfaces and adequate sun protection and ventilation
3. Close-fitting doors and windows
4. Green facades and roof
5. Ground free from past land contamination
6. Cooling tower on shady side
7. Air intake for geothermal energy exchange of incoming air and intake of compressor air on shady side
8. Low maintenance plants and shrubs (water and pesticide demand)
9. Parking spaces, footpaths, entry roads, etc. designed to absorb surface water (e.g. grid stones)
10. Windows on shady side of shed roof for even supply of light and good ventilation
11. High efficiency wall and ceiling insulation throughout the building
12. Windows on roof opening to allow ventilation of hot air at night and which can be closed during the day



**THE ADVANTAGES OF THE SHED ROOF**

The steep part of the shed roof (60-90°) is on the shady side and provides even supply of light and good ventilation inside the building

Even and natural supply of light without direct sunlight provides a safe and economic working environment

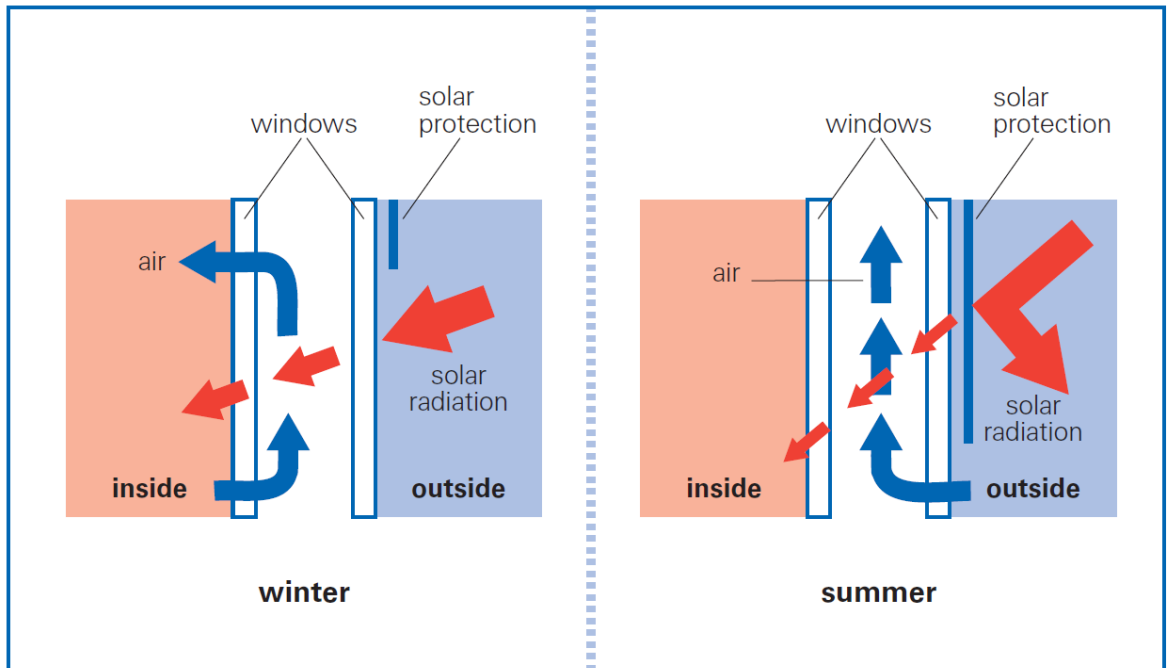


The flat part of the shed roof (~30°) on the sunny side can be used for the installation of solar panels

**ADEQUATE SOLAR PROTECTION AND VENTILATION OF GLASS SURFACES**

In winter, solar radiation passes through the windows and heats the air which circulates inside the building.

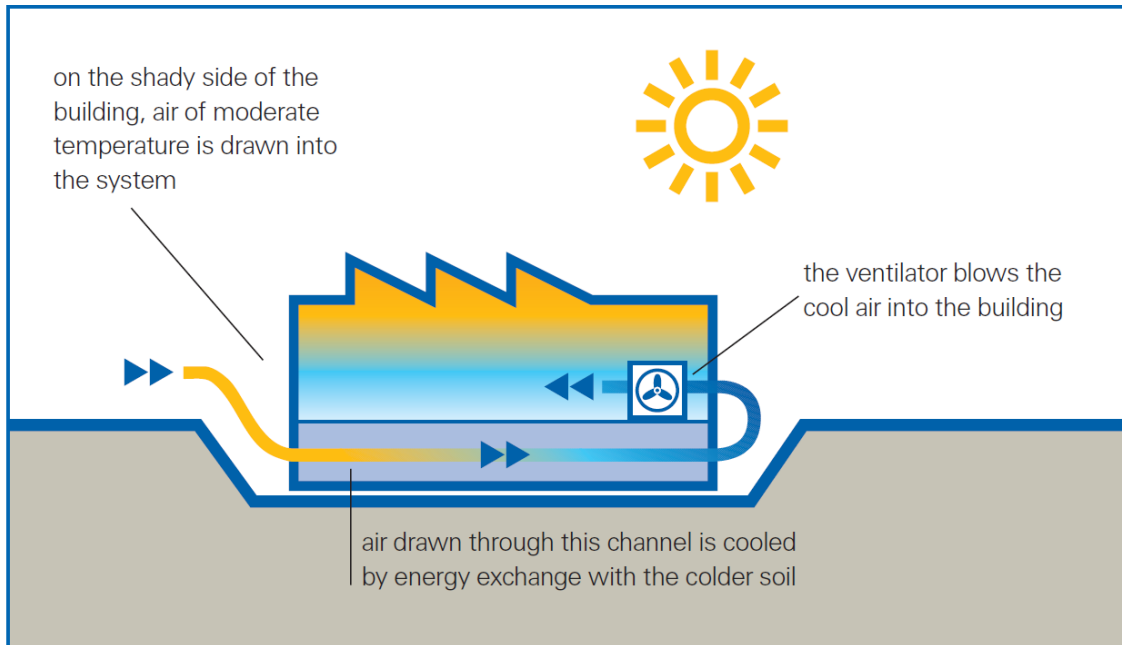
In summer solar radiation is largely blocked by solar protection. Warm air between the two windows is transferred outside the building.





**GEOHERMAL ENERGY EXCHANGE**

The use of geothermal energy exchange is highly recommended for newly constructed buildings, where the ground has to be excavated for the foundations. In the case of an existing building, expenditure for the installation might be too high to make the project economically viable.





## 20. ENERGY

Energy consumption is a crucial factor which impacts on operational costs as well as the environment.

### HOW IMPROVEMENTS CAN BE MADE

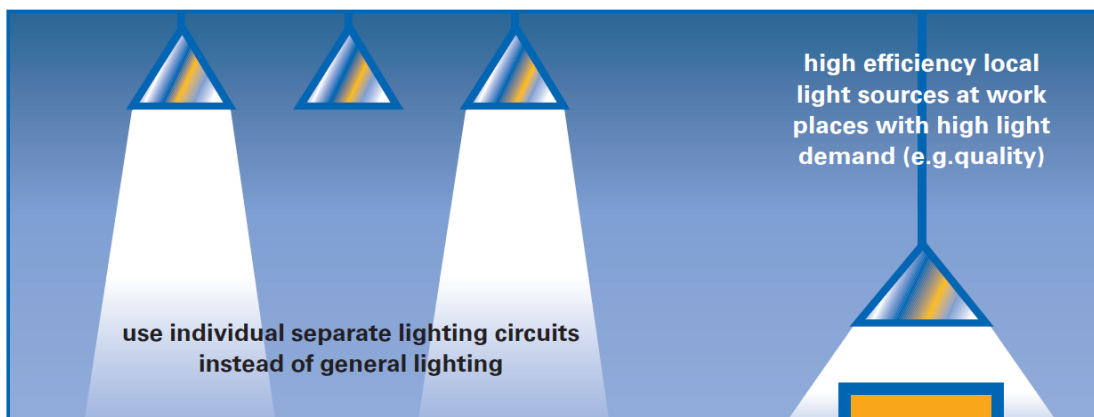
- turn off machines which are not actually in use
- regularly maintain all installations (heating, ventilation, air conditioning and dust or VOC extraction)
- optimise insulation where heating or cooling processes are located
- optimise light
- increase the air-conditioning setting and switch off when factory is unoccupied if your current supplier provides off-peak rates, try to use night current wherever possible
- optimise your air-compression system
- install blind current compensation and peak current control systems
- use co-generation to optimise yields of current and heat or cold
- use renewable energy where applicable
- use LED lighting when possible

### 20.1 LIGHTING

Adequate and functional lighting is essential for the safe and efficient use of any workplace. Excessive use of lights or over-illumination of work areas can be detrimental to the health and the well-being of workers. It also wastes energy.

### HOW IMPROVEMENTS CAN BE MADE

- ensure adequate light intensity
- install lighting circuits in production areas which can be switched on or off individually
- where it makes sense, provide light dimmers
- use motion sensors in low frequented areas
- use high efficiency local light sources in workplaces where demand for lighting is high





## 20.2 AIR COMPRESSION SYSTEMS

Compressed air is the most expensive energy carrier and its usage should be avoided or reduced wherever possible. There are various ways of doing this:

- prevent leakage (one single leakage of 0.1 cm costs ~ \$150 a year)
- set the nominal pressure in the supply system as low as justifiable (in most cases 6 bar is enough; each additional bar costs approx. 10% more)
- introduce heat exchange for compressors, e.g. to preheat process water in textile refining (only 4–6% of the input energy for compressed air production is used for compression; 94% appears as waste heat).

### EXAMPLE:

A factory can save energy for air compression only by regular maintenance (leakage prevention) without any investment. In the case of a production level of 16 million m<sup>3</sup>

p.a., a cost saving potential of US \$4,400 p.a. results from each percentage reduction in leakage.

### **>>Tip:**

You can check your leakage loss very easily by measuring the power consumption of the compressors at times when the production machines are not running (e.g. at weekends).

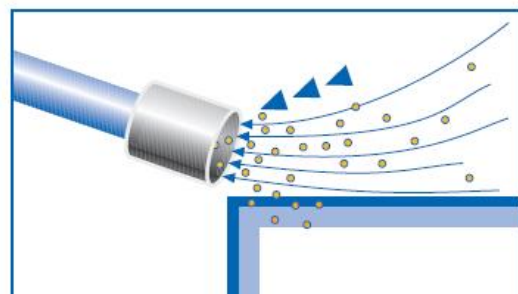
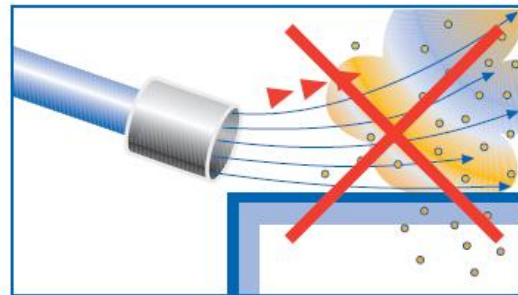
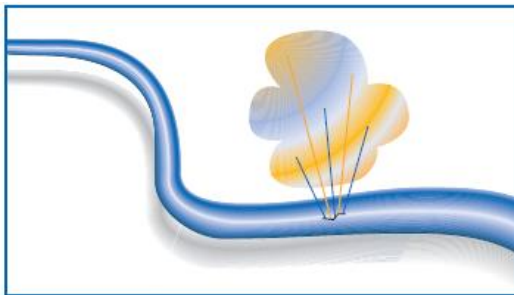
### **EXAMPLE:**

If your compressors run for 2 hours during a measured period of 24 hours to keep the selected pressure constant, the supply system has an energy loss of 8.3%.

### **! PLEASE NOTE:**

Avoid cleaning machinery with compressed air.

It is much cheaper and more efficient to remove dust from components or machinery by means of suction.





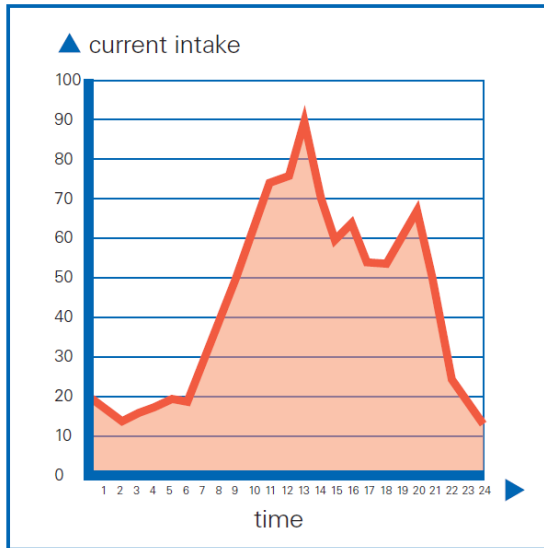
### 20.3 PEAK CURRENT CONTROL SYSTEMS

For power supply companies, the higher the peak of energy consumption, the higher the electricity bill.

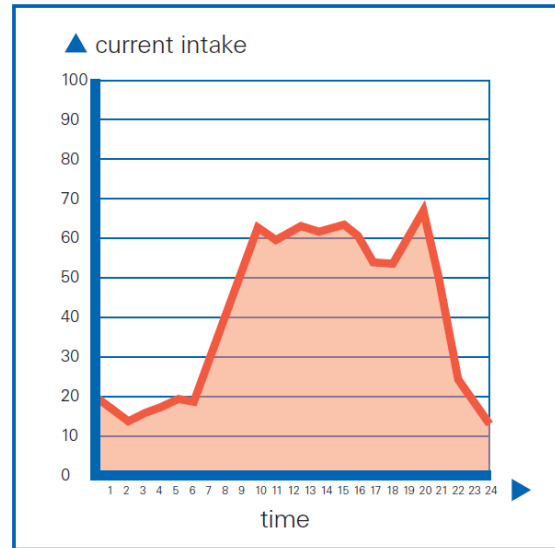
The use of Peak Current Control Systems helps to reduce electricity costs by shifting the time for electricity consumption.

To achieve a more constant rate of energy consumption and to avoid peaks, a computer permanently monitors the actual load. If, in case of a high load, a machine is switched on, the computer simultaneously switches off non-essential equipment, such as cooling systems or compressors, without adversely affecting the factory's operations.

The following pictures show the energy consumption with, and without, a Peak Current Control System in place.



Without Peak Current Control System



With Peak Current Control System Installed

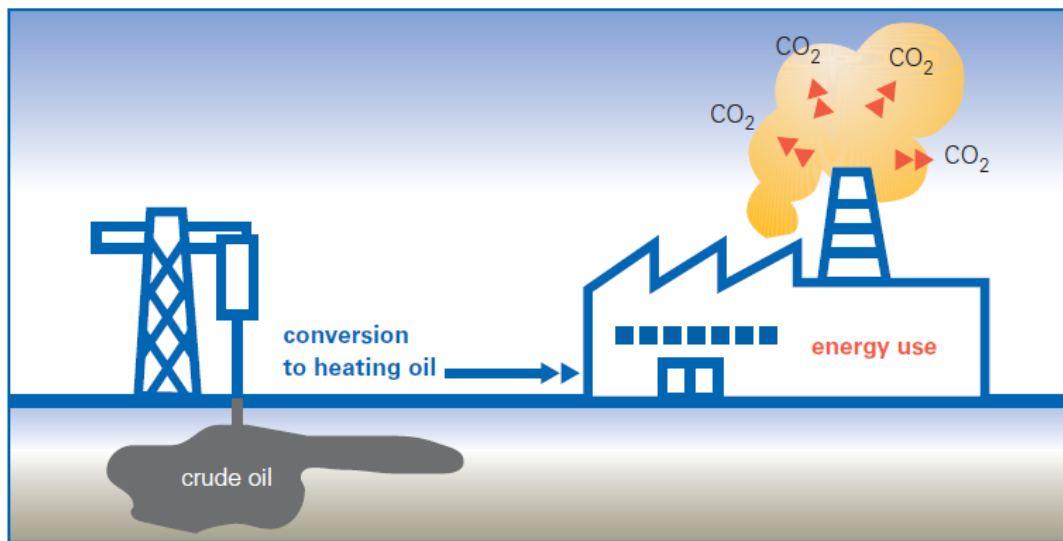


## 20.4 RENEWABLE ENERGY

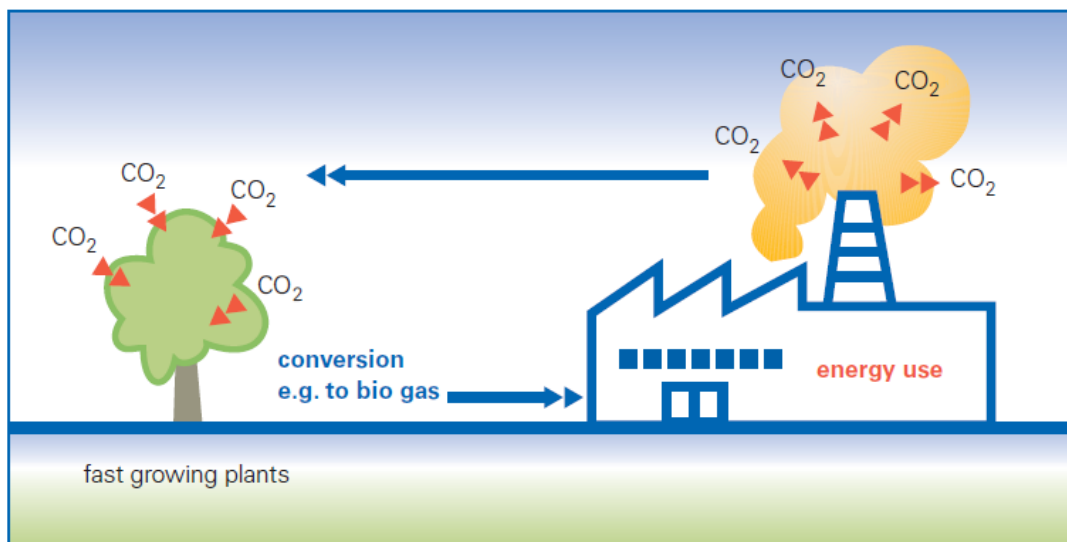
One way of reducing the concentration of carbon dioxide in the atmosphere is to use renewable energy sources. This can be achieved in two different ways:

- use of energy which does not emit carbon dioxide (e.g. wind or water power, solar energy)
- use of energy which consumes the same amount of carbon dioxide during its development as is emitted during the energy use (e.g. fast-growing plants)

**The increase of the greenhouse effect by using non-renewable energy:**



**CO<sub>2</sub> neutral energy use (equilibrium of CO<sub>2</sub> emission and CO<sub>2</sub> consumption):**





## 21. WASTE MANAGEMENT

### THE MAIN CHAPTERS OF THIS SECTION ARE :

1. The Cost Of Waste
2. Waste Minimization And Waste Audit
3. Waste Streams
4. Hazardous Waste Storage Areas
5. Waste Containers
6. Plastic bags in retail

“Waste minimisation” is a systematic approach to minimising the production of waste at its source.

### BATA’S WASTE MANAGEMENT GOALS

**Bata’s waste management goals are as follows:**

- a) To eliminate waste impact on the environment through proper disposal channels.
- b) Waste Management and Minimization (WMM) Programs should be established in compliance with all applicable laws and regulations and in accordance with the guidance of the lawyer advising the company.
- c) All regulated waste (hazardous and non-hazardous) must be properly identified and assigned the appropriate “**waste class number**” as required by the applicable government body.
- d) Each company should develop annual goals for waste minimization through reduction of material use, reuse and recycling.

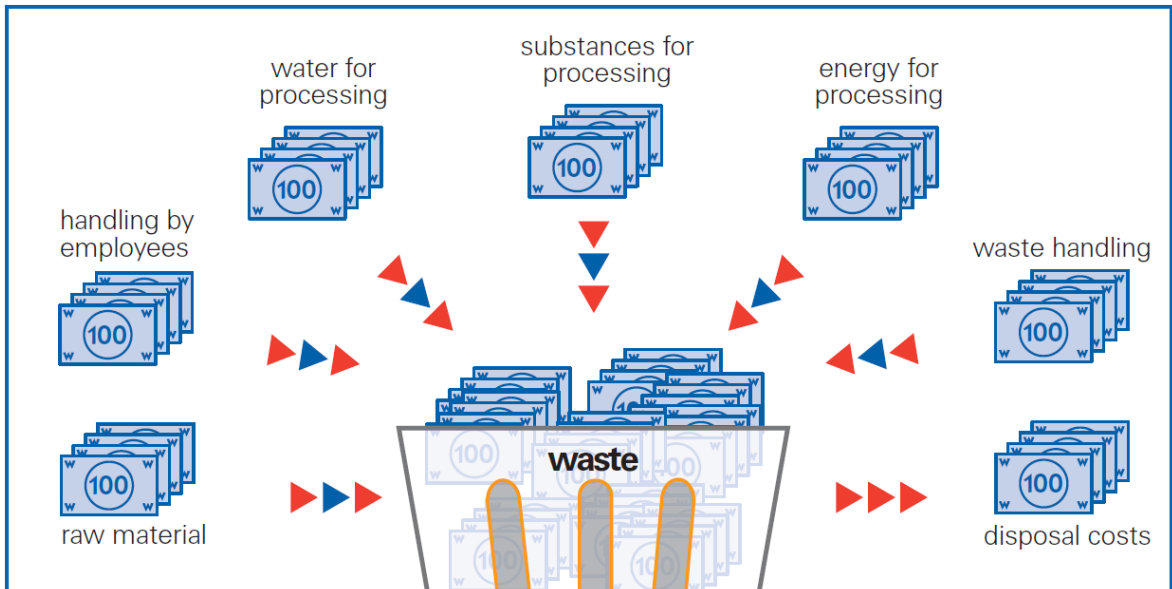




## 21.1 THE COST OF WASTE

The cost of disposal is not the only cost incurred when a factory generates waste (see illustration).

By adopting intelligent waste minimization programs, savings of at least 1% of turnover can be achieved. Calculate your turnover and see what saving potentials you have.



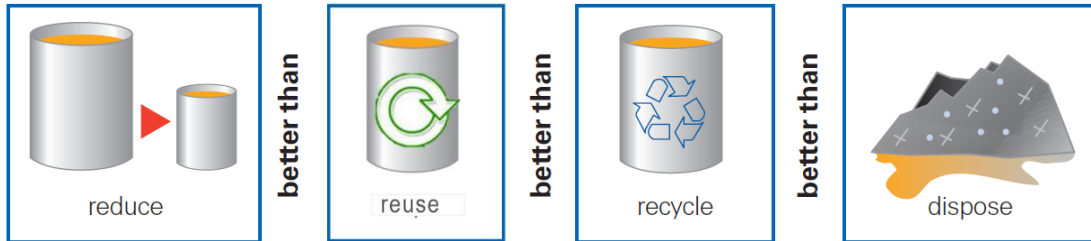
**Effective waste management programs will provide economic benefits to Bata Companies. The benefits include:**

- Raw material cost savings
- Utility cost savings
- Reduced costs of cleaning/maintenance supplies
- Waste material storage cost savings
- Reduced disposal costs
- Sustainable development

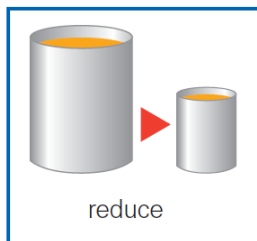
## 21.2 WASTE MINIMIZATION AND WASTE AUDIT

### 21.2.1 THE THREE R'S

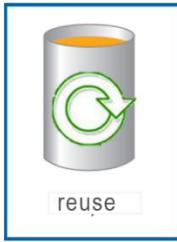
All waste must be subject to the Three R's – **REDUCE, REUSE, RECYCLE**



The basic principle of waste management is to reduce or reuse the consumption of raw materials and the amount of residue requiring disposal. By doing so, the raw materials consumed by a process can be reduced, as can the volume of waste being disposed of.



- reduce amount of sewage sludge by performing proper water extraction (e.g. by use of selective flocculation chemicals or by using filter presses)
- reduce the volume of flush by simple storage so that water is removed under gravity
- plan production to ensure maximum material utilization
- use the minimum amount of material for testing and only test when absolutely necessary
- keep to customer's requirements and specifications to reduce reject levels
- use computerized layout planning systems (CAD-systems) in cutting to optimize the mix of garment pieces and sizes (can lead to a yield of more than 90%)
- ask your machinists to return all partly used reels of thread at the end of each batch/shift; store them in a thread cabinet and reallocate them as necessary.
- Sanitary wastes can be minimized by using low-volume shower heads in locker rooms, low-volume flush cycles in restrooms and by employee education in the three "R's" (Reuse, Reduce and Recycle).



- reuse thread reels
- reuse large plastic bags internally (e.g. to transport garment panels or to collect fabric, yarn and paper waste)
- if possible, reuse batch papers
- where possible, reuse fabric roll tubes, e.g. to rewind remnants; alternatively return fabric roll tubes to the supplier for reuse
- store plastic centers/tubes, reels, bags and sheeting (do not forget the cutting table) and sell them to a local plastics recycler
- avoid using valuable wool waste for machine cleaning, etc. (wool panels are worth approximately US \$1.50 per kg when sold on; equivalent cotton rags from a merchant cost only US \$0.30 per kg)



- Empty drums must be returned to the supplier or to an approved recycling/disposal firm, with no drums leaving the site without approval of the company EH&S Coordinator.
- give used solvents to a disposal company which will re-distil the solvents (external material recycling)
- arrange with your suppliers to return waste fabric, yarn and thread for recycling
- ask your supplier about returning elastic reels and thread reels
- store damaged cardboard boxes, fabric roll centers/tubes, etc. and sell them to a local paper and cardboard recycler



## 21.2.2 WASTE AUDIT

A waste audit should be conducted in each company to reduce adverse environmental factors and also as a means of reducing waste and saving cost. The following points outline some of the areas to be covered but the list can be expanded to meet local conditions and maximize the saving potential:

**a) A plant tour should be conducted to identify and document visible waste.**

**Included should be:**

- **Waste material from cutting scrap leather**, textiles and EVA sheet skeletons. An examination of waste bins on cutting machines is a key item to check.
- **Containers which have not been fully emptied**; cement containers, oil and solvent drums, paper sacks from chemical storage, waste oil from machine maintenance.
- **Leaking service pipes**; steam, compressed air, water, leaking/faulty steam traps. The condensate return temperature in steam heating systems, if too high, indicates faulty steam traps. Live steam use for heating should be eliminated.
- Are heating pipes correctly **insulated**?
- Are boilers adjusted to obtain the maximum combustion efficiency at which they were designed?
- Are boilers, air compressors, chillers the correct size (output) for the current level of demand?
- Old light fittings, unnecessary lights left on. Use of light activated switches and motion detectors to reduce unnecessary lighting.
- Excessive heating/air conditioning settings.

**b) Manipulation losses / extra material issues identified in the departmental Performance Statements**

- Shortages can indicate inefficient cutting and waste and should be documented and the reasons determined to enable their elimination.
- Poor handling of chemicals used in production processes.
- Scorched or incorrectly prepared compounds; how was the waste disposed of?

**c) Chillers and refrigeration systems:**

- Are refrigerated chillers being used to cool processing equipment when the ambient temperature is below 10°C and an ambient air-cooled heat exchanger can be substituted?

**d) Is there full recovery of waste heat from boilers, chillers and air compressors being made?**

- Heat exchangers used to capture waste heat for space heating and process preheating?
- Is waste heat, which cannot be utilized, being removed from the work area and not unnecessarily increasing the cost of obtaining the correct environment in the area in which they are located?



## 21.3 WASTE STREAMS

The definition of waste varies in the environmental laws and regulations of different countries. Economic value is not a good indicator of whether or not a material is waste. Furthermore, materials that are sold for heating, recycling or reclamation in some countries are still considered to be waste.

In substantially all jurisdictions, however, waste is classified as either regulated (i.e. hazardous) or non-regulated and the defining criteria are specified in the appropriate legislation.

**When considering waste streams, three elements must be considered:**

### 1. IDENTIFICATION

All waste streams generated in the company must be identified by auditing the type of waste, the amount generated and the disposal costs. On an annual basis, this audit must be revised to reflect current and future cost reduction opportunities.

### 2. CLASSIFICATION

All waste streams must be properly and accurately classified in accordance with the governing laws and regulations. The assistance of a consultant may be required in some cases. Generally, hazardous wastes are classified by their characteristics which include toxicity, ignitability, corrosivity, reactivity, and leachate toxic.

Each jurisdiction will generally have a system for determining whether waste must be treated as hazardous or special waste (regulated), with specific handling and disposal requirements, or whether it may be handled as “ordinary waste” (non-regulated) destined for landfill sites.

### 3. REGISTRATION

All regulated waste (hazardous and non-hazardous) must be assigned the appropriate waste class number or designation as required by government. Each company must register with the appropriate department and obtain a waste generator number or similar permit. All conditions on the permits must be reviewed, understood and adhered to.



## MEASURES TO BE TAKEN

### **CLEANLINESS**

Production and storage areas must be kept free of combustible materials (pallets, cartons, wrappings...) and combustible liquid spillage (hydraulic oil...).

Advice is to keep only materials required for a shift or for a day.

In water spray protected rooms, storage and arrangement must be kept as original to maintain protection design adequate with the occupancy.

A good cleanliness level maintained in all the plant allows keeping safety issues free and extinguishers accessible.

### **PREVENTION MEASURES**

- Each container or storage tank shall clearly be labelled with the type of waste it contains and its associated hazards if any.
- Maintain a good standard of housekeeping around the waste collectors to decrease the combustible load.
- Approved metal waste containers must be used to collect oily rags as well as mineral absorption materials in case of leakage (maintenance department,...).
- Flammable liquids and gas waste shall be stored in a vented area to avoid the built up of an explosive atmosphere in a confined space.
- Perform a study of waste compatibility in order to ensure that the different types of waste generated can be deposited in the same container. For example, incompatible waste could be material containing oxidizing substances and combustible wastes.
- Incompatible wastes have to be stored in dedicated independent containers. A formal waste collection procedure including communication to all persons potentially involved in waste production and collection shall be established.



## 21.4 HAZARDOUS WASTE STORAGE AREAS (HWSA)

1. **Designate each HWSA.**

**Identify with highly visible sign(s).**

It must be located on an impervious (liquid tight) surface with containment.

2. Area(s) must be **isolated**, have **restricted access and fencing**.

3. Locate area(s) **away from property lines and from all drain systems**.

4. **Drainage** is to be controlled manually through sumps with pumped or syphoned discharge. Floor area must be sloped to the sump so that spillage or storm water accumulation does not contact the base of the containers. If containers are placed on pallets, the pallets are to be no higher than two tiers, with sufficient aisle space to permit access by a forklift.

5. **Segregate incompatible materials** to avoid explosions, adverse chemical reactions, fires or eruptions in the event of container failure.

Non-hazardous waste must be segregated from hazardous waste. Flammables and oxidants must be isolated from each other, and where possible, located at least 20 meters distance from the property line.



6. Post **“No Smoking”** signs in the area(s).

7. Install a **telephone** near the area(s).

8. Provide at **least one multi-purpose (ABC) portable** fire extinguisher of sufficient size to contain an initial fire.


9. **Protect storage from weather** (extreme heat or cold). Circumstances may dictate roofing outdoor storage areas to minimize storm water accumulation.

10. Maintain absorbent materials and other equipment in the immediate area(s) for spill control.



## 21.5 WASTE CONTAINERS

Hazardous waste must be stored in clearly labelled containers and separated from all incompatible materials.

NO.	WASTE CONTAINER REQUIREMENTS
1	<p>Must be clearly identified with a hazardous waste label. Should also have a “start of accumulation date” tag.</p> 
2	Kept in good condition and handled with care.
3	Kept closed except when filling or emptying.
4	To prevent leakage, waste material must not react with container.
5	Inspected at least weekly for leaks, corrosion and any abnormal conditions and to update inventory. Deficiencies and spillage must be immediately corrected. If any bulging of drum head is noted, the drum must be depressurized. Safety precautions are required.

### Empty Containers:

Containers are considered empty when they contain:

- no more than 25 mm of product or
- no more than 3% by weight of the total capacity of the container if the container is less than or equal to 380 L in size or
- no more than 0.3% by weight of the total capacity of the container if the container is greater than 420 L in size

Generally, when there is so little product in the container that it cannot be poured any longer.



**EMPTY CONTAINER HANDLING**

NO.	REQUIREMENTS
1	Must be disposed of to the original raw material supplier or to an approved reclaimer. Containers may contain residual product and must be treated in accordance with labelling requirements.
2	Empty drums which formerly contained hazardous or regulated chemicals must be disposed of through a specialist and locally authorized disposal contractor.  Empty drums and containers should not be sold or given to employees since they could represent a significant health hazard to anyone other than specialist disposal companies.
3	The drums must be transferred to the HWSA and must be placed in such a way that rainwater will not collect in them during storage. Once a sufficient number of drums have accumulated, drum reclamation and a pick-up schedule are to be established. Labels are to be removed and stencils painted over before shipment. Empty drums are to be shipped with top cover and bung loose.  Remove all reference to "Bata" on container.

**21.5.1 GENERAL SAFEGUARDS****GENERAL REQUIREMENTS FOR WASTE STORAGE & HANDLING**

NO.	REQUIREMENTS
1	To <b>avoid explosions</b> , cutting torches must not be used to remove the top or to open a drum unless it has been emptied, thoroughly cleaned, bung opened and inspected by safety personnel.
2	To avoid fires, <b>never store incompatible wastes in the same container</b> .
3	Liquid waste must be stored in the HWSA or on raised platforms with self-contained sumps.
4	Rejected or damaged drums are to be stacked to prevent rainwater collection and disposed of in accordance with applicable laws and regulations.
5	Long term storage, in excess of 30 days, must meet applicable regulations.

**21.5.2 COLLECTION AND TRANSPORTATION OF WASTE**

NO.	REQUIREMENTS
1	The Shipper/Receiver is responsible for the safe removal of hazardous waste and must be trained in: <ul style="list-style-type: none"> <li>• all aspects of the waste management system and</li> <li>• transportation laws and regulations</li> </ul>
2	The manifest system will be managed by the Shipper/Receiver, under the direction of the EH&S Coordinator. The original copy of the manifest and the copy returned to the company by the receiving waste disposal site must be retained indefinitely and kept together.
3	The load being removed will be inspected to ensure safe arrangement, securement and application of methods to prevent upset.
4	All <b>hazardous waste</b> must be <b>properly packaged</b> and <b>marked with safety marks</b> , labels, signs and placards in conformance with transportation laws and regulations.
5	For substances specified in applicable laws and regulations an emergency response plan must be prepared. Documents for each shipment must show the emergency response plan number and phone number for activating the plan.
6	Bata Companies should <b>only use carriers certified and licensed</b> to handle the specific waste being generated.
7	A system must be in place to receive confirmation that the shipment safely reached its destination. This is accomplished by the <b>return of the completed manifest</b> .

**21.5.3 SELF INSPECTIONS**

Weekly inspections should be conducted for the purpose of maintaining good “environmental housekeeping” practices and to identify damaged containers or other deviation from Guidelines.

Inspection records must be retained for one year from the date of the inspection.



## 21.6 PLASTIC BAGS IN RETAIL

The Bata Group highly recommends using only biodegradable bags as they can, in the right conditions, degrade properly.

### Traditional plastic bags

Polyethene bags are made from a non-renewable resource and are incredibly harmful to the environment as they never biodegrade. Instead, they will simply break into smaller and smaller pieces over hundreds of years, inflicting untold amounts of damage to natural ecosystems.

### Degradable or Oxo-Degradable bags -currently used in some Bata stores

#### **Great in theory, environmentally destructive in reality!**

These bags have chemical additives added to help them break down, and they disintegrate more quickly than standard plastic bags. But, they don't disappear completely! They just degrade into smaller and smaller particles, becoming micro-plastics.

### Biodegradable bags

Bags that can potentially biodegrade.

It is important to take note of the 'right conditions' biodegradable and compostable bags require to break down: the temperature needs to reach 50 degrees Celsius, and the bag needs to be exposed to UV light.

Usually, nothing biodegrades in a landfill. But if biodegradable plastics do break down in this oxygen-free environment, they'll emit methane, a greenhouse gas 23 times more potent than CO2.

### Compostable bags

Compostable trash bags will turn into compost over time. They are the best alternative to plastic bags but are not resistant enough to hold shoe boxes.

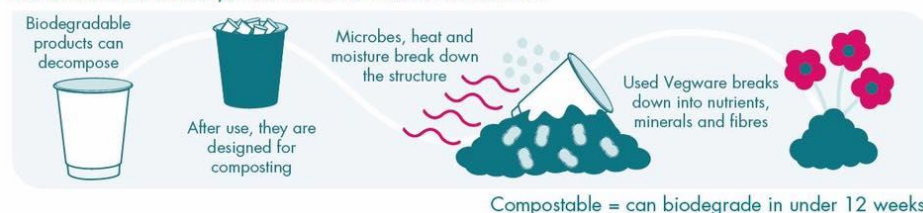
#### Degradable or oxo-degradable plastic

oil based plastic plus an additive that makes the product fragment in oxygen and sunlight



#### Compostable or biodegradable

can break down naturally, with microbes, warmth and moisture





## 21.7 BOXES IN RETAIL STORES AND WAREHOUSES

Packaging is “a coordinated system of preparing goods for transport, distribution, storage, retailing, and their end-use; the means of ensuring the safe delivery to the final consumer in a sound condition at minimum cost; a techno-economic function aimed at minimizing the costs of delivery while maximizing sales”.

The packaging system functions are:

- Protect the product.
- Promote the product.
- Provide information on the product, usage, health and safety, disposal, etc.
- Enable the convenient transportation and usage of the product.
- Allow the unitization of the product through the supply chain.
- Support the efficient handling of the product throughout the supply chain.

### Use Recyclable Materials

The easiest way to ensure the packaging creates the least impact on the planet is by manufacturing it using recyclable materials such as corrugated containers and shipping boxes, paper, recyclable plastic, etc.

Privilege local resources, local manufacturing, local distribution, reduced transportation Co2 footprint.





## 22. WATER

Historically, water supply and effluent disposal costs have been an insignificant element in total operating costs, and managers have rightly focused on other priorities. This situation is now changing. Water is becoming a scarce resource in relation to demand, and water supply and effluent disposal costs have risen and will continue to rise.

### HOW IMPROVEMENTS CAN BE MADE

- begin your water saving activities with an initial input/output check which considers quantity assessment, origin, whereabouts, materials and additives, and distinguishes between drinking and service water.
- install additional water meters to ensure quick remedial action in case of water wastage (savings are achieved mostly by monitoring and being able to measure and compare).
- for comparative evaluation of water consumption and waste water generation, use indicators or metrics like the specific water consumption per kg or m<sup>2</sup> of product.

### 22.1 INPUT/OUTPUT CHECK

A prerequisite for improvements and water management savings is a systematic investigation of the actual water situation (input and output). Therefore, a detailed analysis of the individual water currents is essential. Begin with a simple data collection exercise using the record sheet shown below.

To obtain data, recent water bills can be as helpful as on-site meter readings (e.g. in the case of a ground water supply).

>>Tip:

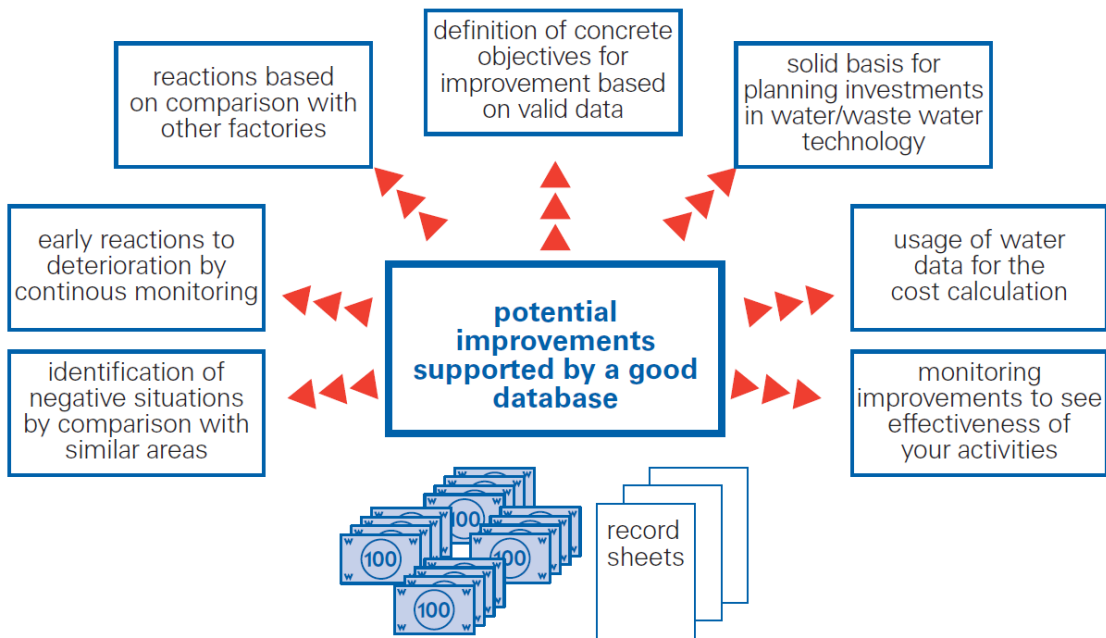
Establish whether or not rainfall is discharged with the trade effluent. If it is, unnecessary disposal costs can be incurred. A rainfall of 1 m/year draining from a 100,000 m<sup>2</sup> site leads to an effluent volume of 100,000 m<sup>3</sup>. Considerable costs can be incurred without proper storm water management.

Based on the input/output data, it is possible to plan for reducing or even ceasing the treatment of water.



Record sheet for gathering input/output data:

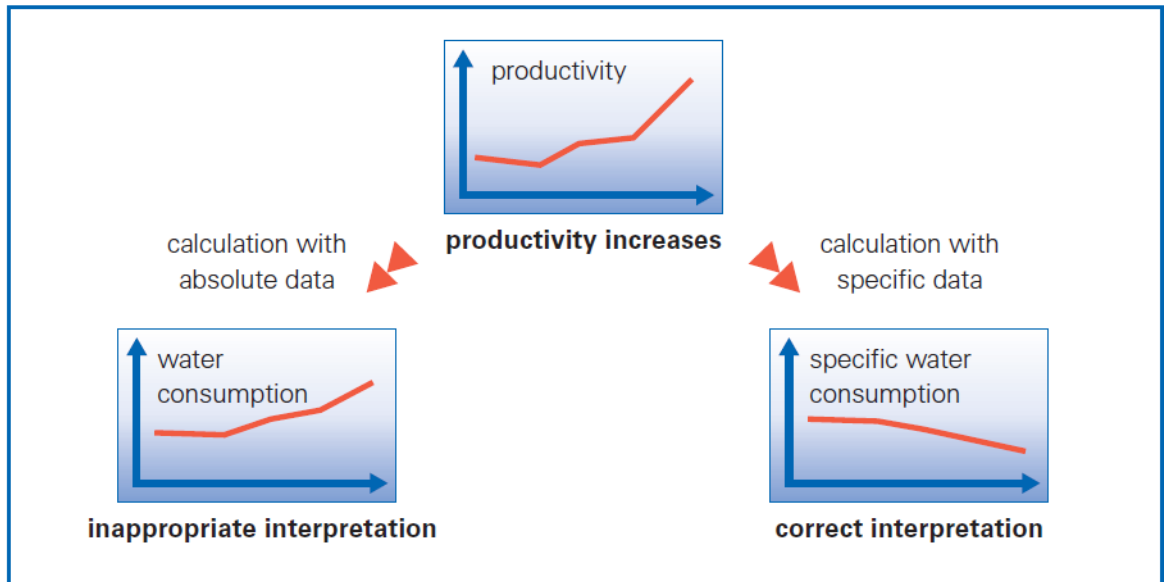
Record Sheet							
<b>Input</b>							
	Total [m <sup>3</sup> /a]	1	2	Area 3	4	5	6
Drinking Water							
Service Water							
Costs (in \$)							
<b>Output</b>							
	Total [m <sup>3</sup> /a]	1	2	Area 3	4	5	6
Production							
Waste Water							
Cooling Water							
Washroom Water							
Rainfall Water							
Costs (in \$)							



## 22.2 INDICATORS

In order to interpret the input/output data collected correctly, it is necessary to normalise this data against changing patterns of production. This requires the data to be converted from absolute numbers into consumption or discharge figures per unit of production.

**Example of a factory with increased productivity and improved water saving technology:**



People are often unaware of the cost of seemingly insignificant leakages. However, water loss can be substantial, especially if multiplied over the whole site (how many potentially leaking taps do you have on your site?). Remember too, that leaks continue for 24 hours a day, seven days a week and 52 weeks a year.



## 22.3 WASTEWATER

Control discharges of waste water or effluent containing hazardous materials to the environment and Municipal Wastewater Treatment Works (“MWTW”).

**Hazardous materials are defined as:**

- Substances that degrade/alter water quality and render it harmful to fish or other aquatic life; and
- Water that contains a substance in such a concentration that, if added to other water, it would degrade the water quality and cause harm to fish or other aquatic life.

Contamination of water in the surrounding areas can present undesirable consequences including adverse effects to employees and neighbors. While the source of the contamination may be external to the site, use of the water in processes, consumption and discharge to another receiver can have obvious impacts.

**Prudent actions include:**

- risk identification (sources)
- impact evaluation
- source monitoring and evaluation
- engineering, maintenance and operational guidelines, including water monitoring and well inspection and maintenance guidelines for the prevention of contaminants entering water supplies through well casings etc.



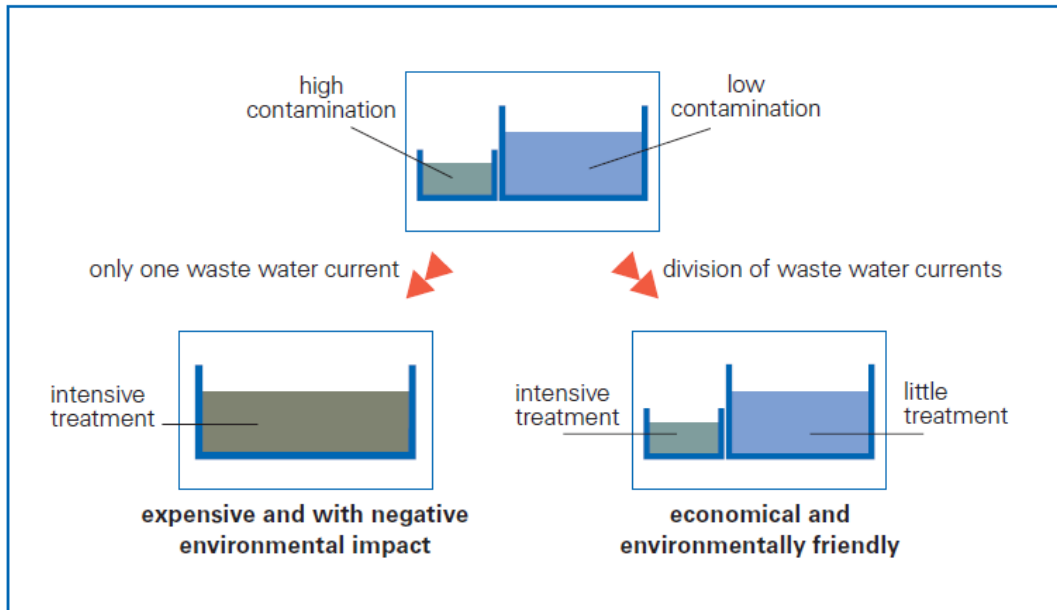
Companies have to comply with all applicable laws and regulations governing the adverse release of hazardous materials.





### 22.3.1 SEPARATE CLEAN AND DIRTY WATER

The costs of treating waste water at a site are directly linked to the standard of treatment required, the method of treatment applied, and the volume of waste water collected. To reduce treatment costs, follow the principle of separating clean and dirty water flows. Highly contaminated water (which may come from a few, specific sources) should be collected and treated separately from less contaminated water, such as storm water runoff. In this way, treatment costs and environmental repercussions will be reduced.



A good water management system divides waste water into 3 different stages.

1. Highly contaminated water is treated or disposed of as waste.
2. Medium-contamination water can be discharged into a municipal sewage treatment plant.
3. Low-contamination flows can be recycled internally. Since this division into 3 different flows requires a clearly separated piping system, it is usually introduced for new or reconstructed buildings.

Contamination	Examples	Further methods
high contamination	residual washing effluent residual padding effluent residual printing paste concentrated de-sizing effluent	waste water treatment waste water treatment disposal as waste disposal as waste
medium contamination	washing and soaping baths from bleaching and dyeing processes with COD between 300 and 1,500mg O <sub>2</sub> /l	discharge to a municipal sewage treatment plant (without own treatment)
low contamination	washing water with COD < 300mg O <sub>2</sub> /l	internal recycling

**22.3.2 GENERAL GUIDELINES**

The following General Guidelines will assist in reducing water contamination:

NO.	GUIDELINE
1	<p><b>Do not dispose of hazardous, toxic or unknown chemicals into sanitary sewers or drain systems.</b></p> <p>Such waste is to be disposed of in a proper manner i.e. all hazardous and/or toxic waste disposed off-site using an approved licensed contractor/waste disposal firm, with all aspects fully documented.</p>
2	<p><b>Do not store or use hazardous, toxic or unknown chemicals in close proximity to storm or sewer drains.</b></p>
3	<p>Dispose of dated or damaged products and materials in conformity with current laws and regulations and in an environmentally acceptable manner. <b>In no case should products and materials be disposed of into a storm drain system.</b></p>
4	<p><b>Wash vehicles</b> utilizing an <b>approved, bio-degradable soap</b> with waste streams drained into a sanitary sewer system.</p>
5	<p><b>Drain wastewater residue from floor scrubbers into the sanitary sewer system.</b> In no instance should this form of wastewater go into a storm drain system.</p>
6	<p><b>Never dump or drain waste material into a body of water or an aquifer recharge basin</b> (whether or not such material is considered to be hazardous or non-hazardous).</p>



### 22.3.3 EFFLUENT EVALUATION

**Those facilities which have the following features must evaluate the characteristics of their effluent:**

- Discharge any industrial wastes to septic systems.
- Have a dry weather discharge volume which is either 20,000 liters/day or 1% or greater of the receiving stream of municipal wastewater treatment plant (MWTP) flow.
- Discharge in close proximity to a potable water intake ( $\frac{1}{2}$  kilometer or less). This is particularly important in companies which have boreholes or wells for the supply of potable water to the business premises or residential compound. Great care must be exercised to ensure that during the wet season the discharge of effluent does not seep into the larger area and higher water level near the borehole.
- Discharge sites which may be flooded during monsoon rains must be controlled to ensure that effluent is not discharged into a flooded area which can dissipate the effluent discharge over a wide area with potential contamination of bore holes or wells.
- Storm drains must be maintained and be sealed to prevent leakage of effluent through breakages into any area other than the designated and controlled site for the discharge of the effluent.

**To evaluate effluent characteristics the following processes are to be followed:**

- Volume measurements sufficient to gauge flow and fluctuation with production capacity.
- Analysis of two 24-hour composite samples. Production conditions are to be established simultaneously so that they can be compared with the analytical data obtained. Analyses are to include:
  - Ph; Total Suspended Solids.
  - Oil and Grease.
  - BOD (Biological Oxygen Demand is the amount of molecular oxygen required to stabilize the decomposable matter present in a water by aerobic biochemical action).
  - Total VOC (Volatile Organic Compounds).
  - Persistent Organic Pollutants which are chemical substances that persist in the environment, bio accumulate through the food web, and pose a risk of causing adverse effects to human health and the environment.
  - Heavy Metals.
  - Materials used (or produced) on site (exclusive of laboratory reagents).
- Representative samples, as required by the permit, must be collected using the techniques approved by local authorities having jurisdiction for the required parameters. All appropriate records must be kept.
- Samples of intake water should be collected at the same time and analyzed for the same parameters to determine the facility's net effluent characteristics.



- If storm water is handled in the same sewers as plant effluent, one set of samples is to be taken during wet weather. If storm water is handled separately, but drains from process or material storage areas, it is also to be characterized based on at least two samples.
- If intake water is taken directly from a lake or river, or trace levels of materials not used in the facility are found in effluent waters, the intake water should be analyzed.
- Effluent analysis should be done by a certified and approved outside commercial laboratory that will provide accurate and timely reports.

### 22.3.4 EFFLUENT MONITORING

All process discharges to surface streams or a MWTP are to be under some form of monitoring for continuing control.

**Monitoring is to be:**

- Reviewed with the EH&S Coordinator or external consultant
- Reviewed by the external lawyer advising the company on environmental matters
- Tailored to the individual situation

**As a minimum, it should include:**

- flow measurement
- analysis of a representative parameter (i.e. pH, VOC, heavy metals, or total suspended solids) indicative of effluent quality

Where discharges are to a natural body of water, monitoring must be more intensive, and must include pH, suspended solids, BOD, COD (Chemical Oxygen Demand measures the nonbiodegradable as well as the ultimate biodegradable organic compounds in terms of oxygen consumption to stabilize the decomposition) and specific organic and toxic metals used in the facility.

In all cases, the analysis/monitoring should be done on a frequency sufficient to detect any abnormal conditions. The results of this analysis must be shared with the EH&S Coordinator and lawyer advising the company. The EH&S Coordinator must be familiar with all permit requirements and must comply with them on a consistent basis. A copy of the applicable permit(s) must be readily accessible for reference when needed.



### 22.3.5 IMPACT EVALUATION

The need and procedure for an **Impact Evaluation (“IE”)** should be reviewed with the lawyer advising the company if normal effluent constituents are acutely hazardous, carcinogens or could impact the public through withdrawal of drinking water from the receiving stream or recreational usage (fishing or swimming). The steps in the IE are:

- An estimation of how much the effluent will be diluted by the receiving stream and predictions of the concentrations that the public might encounter. If discharge is to a MWTP, the evaluation should cover the impact of the effluent on the MWTP process. Calculated results should be reviewed with the EH&S Coordinator, external consultant and lawyer advising the company to discuss response steps that might be required.
- Review of discharge incidents that might occur due to operator error, equipment failure, fire and/or explosion. The effect of such a discharge on the receiving stream or the MWTP must be estimated. If significant, plans should be developed to provide for prevention and control. The phasing out of acutely hazardous materials should be a priority.

### 22.3.6 DESIGN CONSIDERATIONS

#### BUILDING NEW FACILITIES

If effluent treatment equipment is to be installed at new facilities or existing equipment is to be modified, such that the volume or characteristics of the effluent discharge will be substantially altered, **a new permit or modification of the existing permit** must be obtained from any regulatory authorities having jurisdiction.

#### CURRENT FACILITIES

Where the above devices/systems are in use and ground-water impact is a concern, their continued use is discouraged and a program to provide alternate forms of treatment or discharge is to be developed.

Piping, pumps, screens, sumps, etc., must be adequate to accommodate the maximum daily discharge. Backup systems (lift pumps) should exist where necessary to provide adequate protection against surface run-off during a malfunction of primary equipment. Evidence that they are functioning well include:

- minimal odor
- very light or no color
- chlorine concentration between 1-2 mg/l
- suspended solids/oil and grease removal must be within that indicated on the permit

To avoid risk of odor and spillage, wastewater should be stored only for a short period of time before further processing.



**TREATMENT AND DISPOSAL SYSTEMS**

The treatment and disposal of wastewater effluent must comply with or exceed all regulatory and permit requirements.

SYSTEM COMPONENTS	REQUIREMENTS
<b>SYSTEM DESIGN &amp; CAPACITY</b>	<ul style="list-style-type: none"> <li>• Must be capable of accommodating the hydraulic and organic loading of raw wastewater flow from the facility</li> <li>• Effluent must satisfy all conditions of the permit</li> </ul>
<b>EFFLUENT TREATMENT AND MONITORING SYSTEMS</b>	<ul style="list-style-type: none"> <li>• Must be maintained in good working order</li> <li>• Performance inspections must be conducted routinely</li> <li>• Records of inspections and maintenance must be kept</li> </ul>
<b>NEUTRALIZATION SYSTEM</b>	<ul style="list-style-type: none"> <li>• Capacity must be large enough to produce an effluent with a pH consistent with the permit-specified range</li> </ul>
<b>BOD; TOTAL SUSPENDED SOLIDS; AND OIL AND GREASE REMOVAL</b>	<ul style="list-style-type: none"> <li>• Efficiency must meet or exceed permit limitations consistently</li> </ul>
<b>COLOR REMOVAL</b>	<ul style="list-style-type: none"> <li>• Effluent must have a very light color or no color within the permit condition</li> </ul>
<b>CHLORINE RESIDUE</b>	<ul style="list-style-type: none"> <li>• Free chlorine concentration must be approximately between 1 and 2 mg/l, or as stated in the permit(s)</li> </ul>
<b>ODOR PROBLEM</b>	<ul style="list-style-type: none"> <li>• No foul odor must be present</li> </ul>
<b>SLUDGE DISPOSAL</b>	<ul style="list-style-type: none"> <li>• Disposed of either by contract hauling off-site or by on-site processing</li> <li>• For on-site processing, equipment must be well maintained and function properly and adequately without frequent breakdown</li> <li>• Solid content of processed sludge must be in compliance with permit conditions</li> </ul>
<b>SEWER PIPING</b>	<ul style="list-style-type: none"> <li>• Sewer lines, underground piping and pressure lines must be inspected periodically to insure their integrity</li> </ul>



### 22.3.7 ADMINISTRATIVE REQUIREMENTS

Various administrative considerations are summarized in the table below:

SUBJECT	DESCRIPTION
<b>GUIDE</b>	Operating guides must be prepared for treatment and monitoring facilities and include manufacturers specifications and recommended maintenance. The guide is to be updated whenever changes to the facilities are made.
<b>TRAINING</b>	Operators must be trained in the use of equipment and the maintenance of records. Training is to cover normal operations and control of abnormal incidents.
<b>REPORTING</b>	Reporting spills and abnormal discharges in excess of permit limits must follow local legal and regulatory requirements.

### 22.3.8 MAINTENANCE PROGRAM

The need for a good maintenance program is essential. Each company should adopt a program to ensure an efficient, economical, and environmentally secure operation.

**Establishing a maintenance program:**

SUBJECT	DESCRIPTION
<b>MAINTENANCE MANAGEMENT</b>	<p>A system must be developed to identify equipment requiring maintenance. The location and the major process equipment with which it is affiliated must also be identified.</p> <p>A file must be kept on every piece of major equipment containing original shop drawings, correspondence with vendors and manufacturers, purchase orders, spare parts inventories, repair bills, time used, and parts expended.</p>
<b>MAINTENANCE PROGRAM</b>	<p>Follow manufacturers’ recommended maintenance schedules.</p> <p>Maintenance schedules must be developed describing when tasks are to be performed and parts to be used. Maintenance Work Logs (tasks completed, date and operator’s initials) should also be maintained.</p> <p>Aids such as wall chart(s), work order system(s), and a review procedure(s), should be utilized to ensure all necessary work is completed on time.</p> <p>A work order system should be established to initiate all corrective, routine and preventive maintenance tasks (i.e. calibration, lubrication, etc.). The work order system will aid in identifying work to be accomplished and furnish information on any special aspects of the job.</p>



	<p>The work order should be numbered to provide a means of maintaining accountability.</p> <p>Records should be updated on a periodic basis.</p> <p>Maintenance should be done as planned and on time.</p>
<b>PREVENTIVE MAINTENANCE SYSTEM</b>	<p>Preventive maintenance includes much more than simply performing routine maintenance on equipment. It also involves maintaining accurate records of every inspection and servicing, as well as knowing the lifespan of each part to understand the replacement frequency. These records can help maintenance technicians anticipate the appropriate time to change parts and can also help diagnose problems when they occur.</p> <p>Preventive maintenance offers a number of important benefits:</p> <ul style="list-style-type: none"> <li>• Prolonged life of company equipment</li> <li>• Less unplanned downtime caused by equipment failure</li> <li>• Less unnecessary maintenance and inspections</li> <li>• Fewer errors in day-to-day operations</li> <li>• Improved reliability of equipment</li> <li>• Fewer expensive repairs caused by unexpected equipment failure that must be fixed quickly</li> <li>• Reduced risk of injury</li> </ul>
<b>STOREROOM &amp; INVENTORY SYSTEM</b>	<p>The storeroom should carry a spare parts inventory according to the manufacturers' recommended spare parts lists.</p>
<b>MAINTENANCE PERSONNEL</b>	<p>Designated person(s) should be trained and assigned the responsibility for system reliability and service performance.</p>
<b>REFERENCE MATERIALS</b>	<p>The following reference materials must be kept on file:</p> <ul style="list-style-type: none"> <li>• All existing permits</li> <li>• Operation and maintenance manual(s)</li> <li>• Construction record drawings</li> <li>• Construction specifications</li> <li>• Equipment suppliers' manuals</li> <li>• Shop drawings and data cards on all equipment</li> <li>• Annual operations reports (if available)</li> </ul>

### 22.3.9 RECORD KEEPING





Documentation would typically include records and reports prepared by company personnel on maintenance practices and reports of daily pH measurements.

At the request of the lawyer carrying out the EH&S Compliance Review, these records and reports would be made available to this lawyer together with the completed Checklists.

The Country Manager should also consult this lawyer on the need for Effluent Monitoring Reports and Impact Analysis Reports and the lawyer may request such reports. If such reports are prepared by company personnel, they would be reviewed by the Country Manager and then provided to the lawyer.

If the lawyer and the Country Manager agree that an outside consultant is required to prepare such reports, the outside expert would be retained by the lawyer after agreement on the terms of the appointment with the Country Manager. Any such reports from an outside consultant would, of course, also be made available to the lawyer by the consultant completing the report.



## 23. EMISSIONS

Bata Companies have to identify potential exposures and institute programs that are in compliance with the laws and regulations that control discharges (emissions) into the atmosphere.

- Control air emissions within limits specified by government authorities.
- Ensure that proper and current permits, as required for all sources of air emissions, are obtained.
- On an ongoing basis seek to find alternative chemicals which are less volatile and contain no, or less hazardous constituents.
- Install pollution control equipment to comply with all permit and regulatory requirements.

**Clean air legislation is generally concerned with regulating emissions of:**

- Volatile Organic Compounds (VOCs)
- Nitrogen Oxides (NOx)
- Sulphur Dioxides (SO) and related contaminants from fuel burning appliances
- Ozone depleting substances
- Greenhouse gases
- Persistent Organic Pollutants
- Other designated air contaminants such as Toluene, Xylene, Lead, Cadmium, etc

**Sources of air emissions falling under regulatory control include:**

- Spray application of lacquers/adhesives
- Rubber, EVA, PVC, and PU compounding and processing
- Tanning operations
- Heating/refrigerating plants
- Footwear assembly using cements/solvents
- Fuel burning equipment firing boilers, furnaces, incinerators
- Noise levels from persistent noise emitting machinery or production processes
- Vibration from heavy machinery

**23.1 CONTROLLING AIR EMISSIONS**

NO.	AIR EMISSION GENERAL GUIDELINES
1	All covered process equipment should have valid operating permits that are renewed as required by governments.
2	VOCs, NO <sub>x</sub> , SO <sub>x</sub> , opacity, emission rate, volume etc. must be within permit limitations.
3	Exhaust fans/vents should be functioning properly. Process areas should be well ventilated.
4	Combustion equipment should be set-up properly and maintained at optimum efficiency. Visible emission tests on stacks should be performed per permit stipulations. The cleanest burning fuels possible should be used. Air quality must be in compliance with permit requirements.
5	All leaks from CFC/HCFC equipment must be halted or minimized as soon as possible.
6	<p>Establish the following day-to-day routines:</p> <ul style="list-style-type: none"> <li>• Follow labelling instructions or Material Safety Data Sheets when using pre-packaged solvents, cleaners and chemicals</li> <li>• Always cover chemical containers when not in use</li> <li>• Clean up spilled materials promptly and properly</li> <li>• Maintain ventilation systems in proper operating conditions</li> <li>• Separate incompatible materials to prevent reactive mixture</li> <li>• Replace filters for spray coating exhaust systems frequently</li> </ul>



## 23.2 CLEANING METAL PARTS WITH SOLVENTS

Where solvents are used to clean parts (i.e. Repair and Maintenance), the following guidelines are advised:

NO.	USE OF SOLVENTS
1	The solvent container must have a cover.
2	The solvent parts cleaner must have a facility for draining cleaned parts.
3	If used, solvent based spray should be a solid stream at a pressure which does not cause excessive splashing. Atomized sprays should not be used.
4	<p>A permanent, conspicuous label should be placed on the container that summarizes the following operating requirements:</p> <ul style="list-style-type: none"> <li>• Close the cover whenever parts are not in the cleaner.</li> <li>• Drain cleaned parts for 15 seconds or until dripping stops.</li> <li>• Secure each cleaner so that it cannot be easily spilled.</li> <li>• Keep absorbent material for quick response in case of a spill.</li> <li>• Know the destination of floor drains in case solvent is spilled.</li> </ul>

## 23.3 EMISSION SOURCE IDENTIFICATION

Production and processing Companies having emissions entering the atmosphere from equipment, must establish an emission source identification program. In order to establish such a program, the steps outlined below should be followed:

- By calculation or measurement, develop an emission inventory for process sources. The inventory should be reviewed annually or as required to account for changes in emissions.
- Emissions should be evaluated for hazardous characteristics **even if the regulatory authorities do not require this.**

An Impact Evaluation is to be done when the substance emitted could be:

- acutely hazardous
  - a human or animal carcinogen
  - emitted in sufficient quantity to cause concern for public health or environmental impact
- Emissions are to be monitored as legally required. If legal requirements do not exist, daily visual inspections of opacity, particulates and color should be carried out and the results should be reviewed.



## 23.4 IMPACT EVALUATION FOR EMISSIONS OF POTENTIAL CONCERN

An Impact Evaluation is usually required by legislation or if the normal (continuing) emissions meet the hazardous characteristics defined in Chapter 18.

**The Impact Evaluation is to consist of:**

- a) An estimate of emission composition and loading prepared from source sampling or engineering calculations.
- b) Where appropriate, conduct dispersion analysis to estimate the potential concentrations outside the property due to the continuing emission under various atmospheric conditions.

The results of the dispersion analysis are to be reviewed to determine if further studies are required. If exposure is likely to be adverse, a program to reduce risk via process/material changes or installation of controls is to be developed.

The requirements of this Section will most likely require the expertise of an outside consultant, working with an internal company representative(s). The need and procedure for an Impact Evaluation should be reviewed with the lawyer advising the company.

## 23.5 GOOD OPERATING PRACTICES

### 23.5.1 DESIGN CONSIDERATIONS

If new facilities having emissions are installed, permit requirements must be reviewed with regulatory authorities to establish specifications before design of the facilities.

### 23.5.2 ADMINISTRATIVE REQUIREMENTS

**The administrative actions listed below are needed to maintain adequate operating control:**

- **Manufacturer's Manual:** Must be maintained for all air control devices. Must include manufacturer's equipment specifications and recommended maintenance.
- **Operators:** Operators are to be trained in use of equipment and the maintenance of records.
- **Maintenance:** Air pollution control and/or air control devices are to be maintained in good working order with performance inspections conducted routinely.
- **Reporting:** If the control device fails or there is an abnormal release to the atmosphere caused by process or equipment failure, fire, explosion or via a safety vent, a report is to be made to regulatory authorities as legally required.



### 23.5.3 COMMUNITY AIR CONTINGENCY PLAN

Plant Emergency Response, Spill or Disaster Plans are to include a component for accidental releases of air pollutants. The Community Air Contingency Plan is to consider not only those materials released under abnormal process conditions (fire, explosion), but also raw materials and additives that may be discharged due to an operational mishap.

**The Plan is to include:**

- Identification and quantification of substances which may be released or formed.
- An evaluation of the probable route and concentration of material released based on engineering calculation and/or dispersion modelling.
- Emergency response steps and agency notifications (police, hospital, factory inspector, etc.) coupled with a community warning system developed jointly with regulatory authorities. These steps require joint training of company and community personnel.
- Hospital, firefighting and first aid personnel should be informed of materials that potentially could be released so that remedial equipment and treatment procedures are available. The decision regarding the detail of a Plan should be reviewed with the Country Manager.
- Where required, an implementation plan for periods of unacceptable ambient air quality (i.e. "high pollution index") where emission reductions may be requested.

### 23.6 RECORD KEEPING

The objective of the preparation of the documentation is to assist in ensuring compliance with all applicable laws and regulations.

Such documentation would typically include records and reports prepared by company personnel on maintenance practices.

At the request of the lawyer carrying out the EH&S Compliance Review, these records and reports would be made available to this lawyer together with the completed Checklists.

The Country Manager should also consult this lawyer on the need for Monitoring Reports and Impact Analysis Reports and the lawyer may request such reports. If such reports are prepared by company personnel, they would be reviewed by the Country Manager and then provided to the lawyer.

If the lawyer and the Country Manager agree that an outside consultant is required to prepare such reports, the outside expert would be retained by the lawyer after agreement on the terms of the appointment with the Country Manager. Any such reports from an outside consultant would, of course, also be made available to the lawyer by the consultant completing the report.



## 24. NATURAL HAZARDS

The frequency and severity of events related to Natural Hazards have been increasing in the recent years. This is the reason why it is important to identify the site natural hazard exposition, and to implement adequate procedure.

### 24.1 FLOODS

#### RISKS

A flood can have many consequences, in addition to immediate damage:

- Limited access to the facility due to flooding of the surrounding areas.
- Impossible reconstruction (land and/or factory irrecoverable) after a flood.
- Impossibility of fast restart of activity.
- Vulnerability of some equipment to soiling or power cuts.

#### MEASURES TO BE TAKEN

The first step is to identify if the site is located in a flooding zone. If so, it will be necessary to take some measures to mitigate the risk.

##### **For any new installation:**

- Conduct a flood exposure survey at a pre-project phase.
- Eliminate flood exposed location options. If it is not possible, mitigation measures will have to be taken.
- In any case, prohibit the setting up of utilities in undergrounds or levels potentially exposed to flood.

##### **For existing installation:**

- Conduct a vulnerability analysis, leading to an appropriate risk-mitigation action plan (flood plan).

#### FLOOD PLAN

If a flood is impacting the activity of a site, the site BCP (Business Continuity Plan) shall provide the necessary guidance for emergency response, crisis management, sales continuity and operational recovery. Several elements of the flood plan detailed hereafter can be included in the BCP (if not already done).

##### **Main elements of a flood plan:**

Implemented at the beginning of the rising of water, this operational plan will avoid taking decisions under panic and will help to take actions quickly and in an organised manner, in order to limit the flood impact on your activities.



## Monitoring and Alerting:

- Establish contacts with local councils in anticipation of any flood event.
- Define a pre-alert and alert procedure (with the local authorities) with water level monitoring.
- Define a threshold alert level which triggers the flood emergency plan. This decision will be taken by the site management.

## Securing the site:

Create a list of actions needed before, during and after the shutdown of the activities:

- Energies and fluids cut-off.
- Control / Implementation of protection (sand bags, flood gates, concrete block, pumps, diesel generator, etc.).
- Buildings protection (close the openings: doors, windows, pipes...).
- Check the sewage and rain water collecting installations.
- Actions to be taken in basement and low points: water evacuation, height raising of material/equipment/storage, pumping (renting equipment), etc.
- Protection of fire technical rooms (ensure the fire protection installations are effective).
- Protection of critical equipment and storage (evacuate, elevate, provide water tight wrapping...).

## VULNERABILITY ANALYSIS

### LOCATION / FLOOD EXPOSURE

- Is the site located in a flood exposed area?

### ARE THERE ANY AGGRAVATING FACTORS SUCH AS

- Construction located downstream which can generate, by obstruction, a raising water level.
- Constructions located upstream (flood extension area; dam, etc.).
- Evolutions of the area and of the upstream which could modify the reference flood parameters : urbanization, activities, roads, infrastructure, non-draining surfaces.

### OCCUPANCIES OF THE SITE

- What are the « critical locations » of the site?
- What important activities/equipment is located at a level potentially exposed to flood?
- For each of these activities/equipment, what water level becomes a threat to the activity?
- What would be the consequences of an interruption of such activities, depending on the duration of this interruption?
- Are there any alternative solutions?
- How long does it take to stop the production or secure it in standby mode?
- What are the possibilities to dismantle or elevate sensitive equipment and storage?





## 24.2 PRECIPITATION

### RISKS

The risks caused by rain or snow to property are multiple: roof collapse, roof frame deformation, infiltration of water into premises, blocking access to the site, damage to foundations...

### MEASURES TO BE TAKEN

For both new construction and existing construction, certain provisions shall also be followed in addition to the standards and technical rules that are applicable from a regulatory compliance standpoint.

An emergency plan must be formulated outlining the principal measures to be taken in case of an incident.

### PRECIPITATION PLAN

- Organize regular inspections of roofs to check the condition of rainwater drainage and the general roof condition.
- Each day, before closing the premises, check that roof openings (e.g. sky domes...) are firmly closed. Draw the attention of guards to this matter.
- Conduct systematic inspections after heavy rain or storms.
- Regularly remove leaves from gutters and drainage pipes.
- Maintain run-off/drainage networks.
- Protect rainwater drainage pipes against impacts in places of frequent traffic.



## 24.3 EARTHQUAKES

### RISKS

Earthquakes may result in collapse or damage to buildings, equipment or material stocks, as well as personnel injuries.

**The different reaction modes which can lead to damage during an earthquake are:**

- Landslide
- Collapse
- Break of a part of equipment
- Break of a fitting/anchoring component
- Distortion
- Mechanical, electronic or any equipment failure
- Interaction (for instance, flash arc due to an incidental contact)

Experience has shown that the falling of objects, besides being a life hazard, can highly disturb the evacuation and action of emergency services (even the mere risk of object falls can be a factor of disturbance).

### MEASURES TO BE TAKEN

In areas exposed to earthquake, buildings and technical installations shall be constructed according to **internationally recognised standards** of seismic design and construction.

#### AUTOMATIC SPRINKLER INSTALLATIONS

- Automatic sprinkler installations must be adapted to seismic risks. Severe ground-shaking often damages automatic sprinkler systems with inadequate earthquake protection, resulting in water damage and impairment of the system.

#### NATURAL GAS INSTALLATIONS MUST BE ADAPTED TO SEISMIC RISKS

- Seismic shutoff valves on the main natural gas service line to each building.
- Automatic shutoff valves for flammable liquid/gas distribution systems.

#### AN EARTHQUAKE EMERGENCY PLAN MUST BE PREPARED

- The extent of the plan should be developed in relation to the risk.
- Train the emergency response team (ERT) covering all shifts to implement the earthquake emergency action plan and stockpile emergency supplies that may be needed to support the ERT.



Preventive measures should be taken to protect sensitive equipment and goods in these zones:

- Keep heavier items on storage racks on the lower shelves or on pallets on the floor.
- Secure valuable storage kept on open shelves by installing a lip or barrier.
- Store hazardous chemicals in unbreakable containers.
- Ensure deep tanks and other open containers for corrosive or flammable liquids have sufficient freeboard to prevent spillage from sloshing.
- Separate incompatible products to avoid mixing in case of an accidental leak.
- Where process pipes carry very expensive or hazardous liquids, or where pipe breakage would result in extended interruption to production, take as many of the following precautions as is practical:
  - Provide seismic shutoff valves or seismic switch-operated shutoff systems.
  - Provide arrangements similar to that of sprinkler piping, including flexible couplings, flexibility across seismic joints and sway bracing.
  - Provide adequate clearance where the piping passes through walls and floors.
  - Consider flexible piping and welded, rather than threaded, connections.
  - Provide a safe, remote shutoff for electrical service. The efficiency of seismic protection installations shall be periodically controlled and maintained and included in the preventive maintenance program.

**EARTHQUAKE PLAN**

If the site presents seismic vulnerability, an earthquake plan must be drawn up and a scenario shall be included in the BCP.

**MONITORING**

- Establish an annual inspection in order to:
- Detect potential deterioration of buildings and structures
- Check condition of seismic protection equipment
- Control storage organization

**EMERGENCY ACTIONS**

- Schedule the shutdown/standby of processes/activities
- Establish a “to do list” for before, during and after the shutdown/standby

**ACTIONS TO BE TAKEN AFTER THE EARTHQUAKE**

- Establish a monitoring
- Make a standpoint regarding structures and impacted equipment (cracks, distortion, breakage, rupture, etc.).
- Set up a restarting plan of activities, taking into account possible replicas.



## 24.4 LIGHTNING

### RISKS

Apart from fire or from blast effect caused by direct lightning strikes, the most frequent damage is the deterioration of electrical or electronic installations due to overvoltage.

Lightning damage can result from any of the following effects:

- Thermoelectric effects: material overheating (due to overload) leading to mechanical damage.
- Electromagnetic effects: generation of electrical impulses which can damage sensitive equipment.
- Conduction: at its point of impact, the lightning disperses its electrical charges in the ground, affecting grounded electrical equipment in the area and potentially threatening life.

### MEASURES TO BE TAKEN

It is necessary to assess the sensitivity of buildings and equipment to direct and indirect lightning effects.

The vulnerability of a building depends on various geographical parameters (isokeraunic level, wind direction, ground resistance and homogeneity, size of buildings, environment).

### EQUIPMENT PROTECTION

Protection of buildings against lightning is warranted when:

- The type, nature and location of buildings present risks of lightning strikes.
- The lightning level in the region is high: particularly exposed zones are hill tops, valleys, and other areas where the isokeraunic level is  $\geq 30$ .
- The damage and resulting business interruption likely to be caused by the lightning are significant.

**The protection aims to:**

- Conduct the electrical flux to an area of lower risk.
- Ensure a sufficient electrical conduction to the earth in order to avoid heating or destruction of equipment (correct grounding and bounding).
- Protect electrical and electronic equipment, in particular those essential to the safety and continuity of operations.



**There are two main protection methods:**

- **Protection against direct effects:** systems which conduct the lightning to earth when it strikes a building directly - lightning conductor.  
The goal is to offer a natural path for the electrical current (low resistivity), so that no current enters the equipment we want to protect.  
Lightning conductors with radioactive sources shall not be used in the Group for new installations.  
Lightning strikes counting system shall be installed on grounding network.
- **Protection against indirect effects:** systems that divert the energy of the lightning arriving via electrical lines to earth - lightning arrester.  
The goal is to protect electrical equipment; a preferred pathway is provided to the current between the electrical supply line and the earth (this is used in case of sudden overvoltage and only during this short period).

**Yearly inspection of a lightning protection system is essential since it is subject to high wear in actual conditions (degradation at each lightning strike plus potential corrosion).**

**LIGHTNING PLAN**

**Secure the facility:**

The main measures that should be taken when strong storms are forecast and lightning strikes are anticipated:

- Switch the electrical supply on to a protected line (2nd line when the site can be supplied by different lines, UPS, diesel generator).
- Consider stopping production units or to put them on stand-by mode.
- Stop activities specifically at risk.
- Disconnect sensitive equipment and any equipment that presents risks in case of lightning strike.

**Restart site activities:**

After a storm, the restarting must be done with precaution in order to detect potential resulting failures (electrical or electronic equipment).



## 24.5 WINDSTORM

### RISKS

Risks of roofs being torn away or damaged may occur. Certain equipment or merchandise that is not under shelter is also vulnerable.

### MEASURES TO BE TAKEN

For new construction, there are certain standards and technical guidelines to be followed.

Information is often communicated by the local authorities before a storm so that an emergency plan, already established, can be put into action.

### WINDSTORM PLAN

The windstorm emergency plan must include the following points:

- Close doors and windows to prevent the wind from gusting inside.
- Check the anchoring of chimneys.
- Protect glazed surfaces.
- Bring equipment and items kept outside indoors. For items that cannot be brought in, check that they cannot be blown away by the wind. Shelter, secure and protect them.

Specific protection measures must be taken in regions likely to be subject to cyclones, typhoons and hurricanes.



## 24.6 WILDFIRE

### RISKS

Wildfires can occur when prolonged dry weather causes the moisture levels of grass, brush, and trees to become low. Combined with strong winds, they increase the intensity of a fire spreading over a wide area, exposing buildings and equipment in the vicinity.

### MEASURES TO BE TAKEN

#### NEW CONSTRUCTIONS

- Keep at least 30 m between any forest/woodland or brush/grassland
- Give preference to non-combustible construction materials to all facilities
- Install an outside sprinkler system to protect the most exposed facade (oriented forest /woodland side)

#### EXISTING CONSTRUCTIONS

- Create a clearance zone around buildings, by removing trees and shrubs (at least 30m)
- Avoid combustible yard storage (Maintain a minimum of 50 ft (15 m) space separation between yard storage and any building).
- Install an outside sprinkler system to protect the most exposed façade (oriented forest /woodland side)

Information is often communicated by the local authorities when a wildfire is threatening residential or industrial areas, so that an emergency plan, already established, can be put into action.

### WILDFIRE PLAN

**The wildfire emergency plan must include the following points:**

- Address computer server backup
- Remove combustible yard storage
- Relocate valuable stock and supplies
- Place equipment in safe mode for expected loss of utilities services
- Shut down HVAC systems
- Close the building envelope
- Provide temporary covers on air intakes
- Safely store or relocate plastic drums of ignitable liquids



## 25. SOIL & GROUNDWATER

Ground contamination is caused by toxic and hazardous materials coming into contact with the soil.

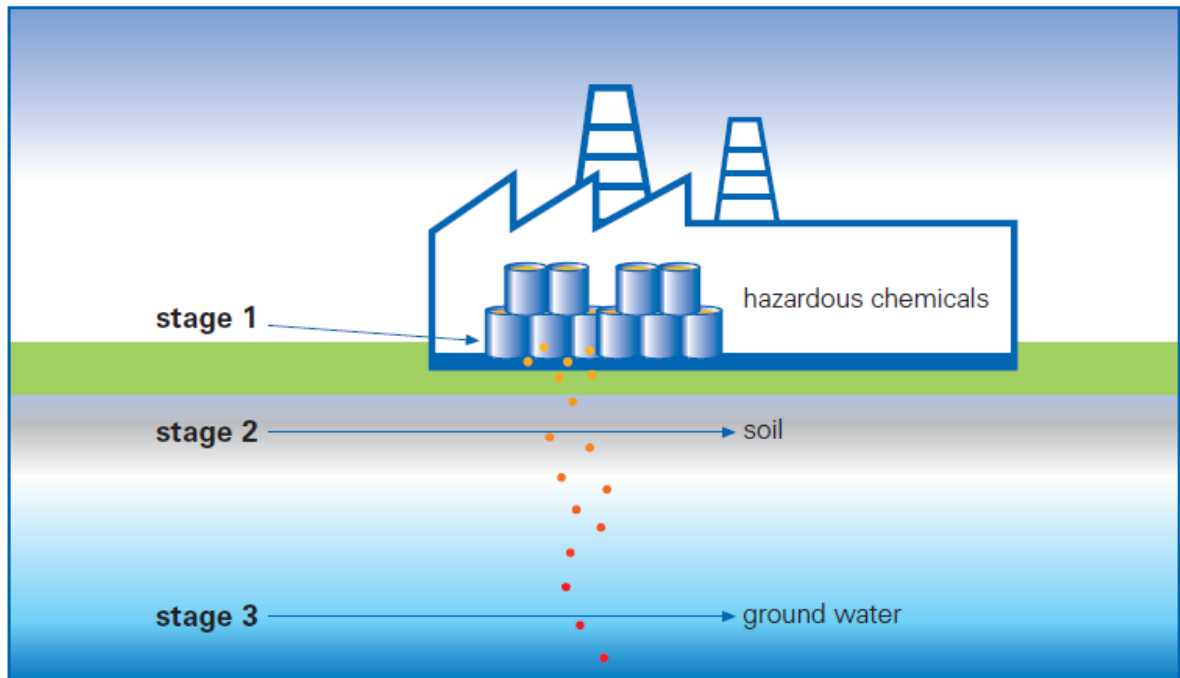
Once the ground has become contaminated it can be very difficult to predict where pollutants may spread. The movement of contaminants will be influenced by the geological structure of the ground, by rain water flushing through the soil, the chemical properties of the contaminants themselves and the way in which they are broken down.

Where remediation of contaminated soil or ground water is required, a company may be faced with extremely high costs.

### HOW IMPROVEMENTS CAN BE MADE

- Regularly check equipment (installations, vessels, etc.) for leakage or other damage and repair immediately if required
- Perform an assessment in the form of a historical search
  - when was the site acquired?
  - what expansions/changes have occurred since the site was acquired?
  - has there been any known contamination of the site?
  - has a contaminated land survey of the site ever been undertaken?
  - where is waste discharged from, what is discharged, and where does it go?
- Estimate hazard
  - take samples from the affected media (ground, ground air, ground water)
- In the case of a confirmed contamination: investigate remediation or clean up
  - develop a remediation plan
  - address ecological requirements as well as technical and economic possibilities
  - decide the type and scope of the measures to be adopted
- Plan remediation or clean up
  - draw up a remediation plan as the contractual basis for the companies involved
- Perform remediation
  - try to achieve the stated remediation target, adhering to the set time and cost plan



**STAGES OF CONTAMINATION**

The following example shows the stages of contamination where there has been poor storage of chemicals.

**Stage 1:**

- Over time, the floor beneath the chemicals becomes contaminated
- Installations in the room are affected
- Building fabric is affected, or is discolored

§ Stage 1 is very **easy to avoid**, e.g. by using secondary containment

**Stage 2:**

- The chemicals reach the soil
- The extent of the contamination becomes difficult to estimate, it may not be visible or accessible

§§ In stage 2, remediation could require the excavation of soil around the contamination source. Many cubic meters have to be disposed of as chemical waste. At stage 2, the cleanup becomes **expensive**.

**Stage 3:**

- Ground water is contaminated
- Once in the ground water, the contamination spreads out into a much larger area

§§§ Ground water is affected. Remediation is **extremely expensive** and can take many years. It could even bankrupt the business.



## SECTION 6 - SECURITY



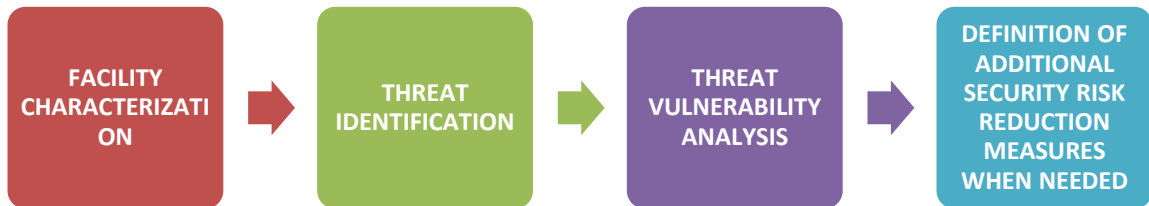


## 26. SECURITY

### 26.1 SECURITY VULNERABILITY ASSESSMENT

A prerequisite to adding any equipment or any organisational measures is to **perform a security vulnerability assessment**.

A global security vulnerability assessment usually involves the following steps:



In order to help identifying site vulnerabilities, the following questions can be used:

- Does the site handle attractive goods / products / merchandises?
- Is product easy to move, transport and to dispose of in the market (shoes boxes)?
- Are confidential or strategic data (archives, drawings, numerical data...) located on site?
- Are attractive materials/products stored outdoors?
- Are the buildings' openings accessible from the outside of the site (presence of grids, bars, reinforced windows, detection)?
- Are areas forbidden for access to the public or to non-authorized personnel provided with a restricted/controlled access device?
- During closing periods are all the accesses of the site locked (gates, doors...)?
- Is a closure round (windows and doors locked, activated alarm...) systematically performed after the site closure?
- Is the general good condition of the site's and buildings' mechanical protections (fence, doors, claddings, windows...) periodically checked?
- Is the area in an inherently high crime zone?

To carry out this security vulnerability assessment, sites are free to use other internal methods and/or to be assisted by an external company (security consultant for example).



## 26.2 POSSIBLE RISK REDUCTION MEASURES

- **For the perimeter protection of a site:**  
fence with access control point at the entrance, micro-wave sensors installed on the fence.
- **For the perimeter protection of the buildings:**  
CCTV with permanent monitoring, periodic security patrols in predefined areas, infrared barriers along the facades of the buildings, mechanical protection by concrete plot in front of distribution agencies having large glass windows.
- **For the perimeter protection inside specific areas of the buildings:**  
volumetric detection of corridors leading to these areas, electronic access control to the sensitive areas, regular back-ups of sensitive electronic data.

## 26.3 SECURITY MANAGEMENT TASKS

Top management must be involved, and a formal security organisation must be structured in every operation.

- Formulate security objectives and procedures
- Carry out a security vulnerability assessment and implement additional security risk reduction measures when appropriate
- Regularly re-evaluate protection of high risk areas
- Establish the requirements for security staffing and/or contract guard services
- Ensure that comprehensive job descriptions are drawn up for all security staff
- Define and organize the intervention of security personnel in case of intrusion
- Ensure that security staff receives adequate training
- Coordinate and monitor security activities, including contract security Service
- Investigate and report all incidents of a security nature to the Managing Director or Operations Manager
- Liaise with local police, emergency services

These tasks shall consider the different degrees of activity of the site influenced by such parameters as: opening and closing hours, week-ends, holiday periods, vacant period if any but also seasonal activity when appropriate.



## 26.4 ACCESS CONTROL

Access Control systems can be simply defined as the process by which security staff controls who enters and leaves the premises and when.

### THERE ARE 2 MAIN TYPE OF ACCESS CONTROL

- Human Access Control
- Electronic Access Control

The system that will be chosen must provide a reliable and permanent security monitoring of all the accesses. At any time, the access control should be able to give the information of who is on site (entries, exits).

### HUMAN ACCESS CONTROL

Security personnel can be used to control the main entrances of the site, of the building or of certain critical areas.

#### **Measures to control visitors include:**

- Requiring them to report to the gatehouse, main reception or designated entrance
- Confirming appointments with company staff prior to access being permitted on site
- Completing a gate/visitor register
- Larger/sensitive sites: Issuing identity card, badge or permit
- Collecting them from reception or the security gatehouse and escorting them to an appropriate exit after the visit, by the host or the last company employee visited
- All staff must co-operate in controlling the movement of unaccompanied visitors on site - either by reporting their presence or enquiring as to their purpose on the premises

### ELECTRONIC ACCESS CONTROL

Electronic access control uses technology and procedures to manage who is able to go where and when. An access control system is composed of:

- Entryways (doors) - Locking devices for the entryways
- Sensors to monitor the door status - open or closed
- Devices to properly identify authorized users
- Devices to permit exiting from the secure area to the outside
- Notification protocols and external system control devices

Electronic access control is complementary to human access control, to help manage isolated or distant accesses for example.



## 26.5 INTRUSION PROTECTION

There are two methods of protecting against intrusion:

- **MECHANICAL PROTECTIONS:**  
The objective is to deter, obstruct or at least to delay a break-in.
- **ELECTRONIC MONITORING:**  
The objective is to detect and to alarm.

Mechanical protections are simply passive protections. Conversely, electronic protections need to be included within a global system incorporating a control unit, alarm components, power supply and human organisation. The control unit is able to regulate the entire system, turn an intrusion detection system on and off, and transmit the alarm signal to a monitoring station.

### ELECTRONIC MONITORING (DETECTION)

- Monitoring of the fence (vibration detectors, shock detectors)
- Monitoring inside the fenced area (microwave sensors and photoelectric beams)
- Unfenced areas (buried sensors and infrared barriers)

### PROTECTION OF THE PERIMETER OF THE BUILDING

It includes mainly protection of all building openings (doors, windows, skylights, ventilation openings, elevator access doors...) either by mechanical means or by electronic means.

**MECHANICAL PROTECTIONS**

- Building walls
- Windows, windows crossbars
- Doors (with locking systems)

**ELECTRONIC MONITORING**

- Contact switches (for windows and doors)
- Sonic and vibration detectors (for walls, windows, ceilings...)
- Infrared barriers

### PROTECTION INSIDE BUILDING

Protection inside buildings is the last protection barrier to detect intrusion.

**MECHANICAL PROTECTIONS**

- Doors
- Locks
- Internal partition

**ELECTRONIC ALARM SYSTEMS**

- Passive infrared detectors
- Microwave detectors
- Photoelectric devices



## SECTION 7 – EMPLOYEE’S HEALTH AND SAFETY





## 27. ASSESSMENT OF HEALTH RISKS

The purpose of an assessment is to enable decisions to be made about measures necessary to control substances hazardous to health arising from any work. An assessment ensures that all the factors pertinent to the work have been considered, and that an informed and valid judgement has been reached about the risks, the steps which need to be taken to achieve and maintain adequate control, the need for monitoring exposure at the workplace and the need for health surveillance.

**An assessment of the risks should involve consideration of:**

- Which substances or types of substance (including micro-organisms) employees are liable to be exposed to.
- What effects those substances can have on the body.
- Where the substances are likely to be present and in what form.
- The ways in which and the extent to which any persons could potentially be exposed, taking into account the nature of the work and process, and any reasonably foreseeable deterioration in, or failure of, any control measure provided.
- An estimate of exposure, taking into account engineering measures and systems of work currently employed for controlling potential exposure.
- Where valid standards exist, representing adequate control, comparison of the estimate with those standards.

If comparison shows that control is likely to be inadequate or become inadequate, then the assessment should go on to determine the further steps which need to be taken to obtain and sustain adequate control.

The assessment may necessitate the carrying out of atmospheric sampling and measurement to determine exposure; particularly where operations are complex or specialized and the substances involved have an occupational exposure limit.



*Zimbabwe Bata employee wearing a mask*





## 28. EMPLOYEE EXPOSURE TO INFECTIOUS DISEASES

Each company must be aware of the risks to which its employees are exposed and take measure to minimize the risks and contain any outbreak which may occur in the workplace.

**Infectious disease risks can be categorized as:**

- Contagious infection spread by air borne transmission from infected person to others; Tuberculosis, SARS
- Diseases transmitted by an insect bite from an infected person to another person; Malaria, Dengue fever
- Diseases transferred through contact with bodily fluid from an infected person to others; HIV, hepatitis (particularly in respect of accidents in a company where blood may be present)
- Diseases spread through food or water from person to person; Hepatitis A and B, salmonella or E. coli bacteria
- General illness contacted from polluted or unsafe water

**The actions which should be undertaken to minimize risks include:**

1. Medical facilities must be available to identify employees who are a risk to other employees and have them placed on sick leave till they are no longer able to spread the disease to other employees through normal work activities.
2. Continuous action to eliminate the breeding of mosquitoes on the company's premises to reduce the possibility of employees being bitten and contacting a disease from a carrier insect.
3. In countries where there is a high level of HIV/AIDS and hepatitis in the general population, employee education regarding the causes and its spread should be conducted and measures to reduce the spread of the diseases promoted.
4. Strict hygiene in food preparation and serving in canteens (including where the services are outsourced) is mandatory. Persons handling food must follow strict personal hygiene. Adequate hygienic washing facilities must be available. Canteens and associated areas must be free of rodents and other carriers of disease.
5. Drinking water made available to employees must be potable. Testing must be undertaken by competent and authorized testing laboratories to ensure that the water is free of toxic chemicals, heavy metals, coliform or E. coli bacteria. This is particularly important when water is drawn from boreholes or wells and frequent tests are required at different times of the year, especially when there is flooding of the ground anywhere in the vicinity of a well or borehole from which the water is drawn.



## 29. EMPLOYEE EXPOSURE TO NOISE

Protection against the effect of noise exposure must be provided when the sound levels exceed those shown in the table “**Permissible Noise Exposures**”, when measured on the A scale of a standard sound level meter at slow response.

Note: The permissible noise exposure is based on a regulated noise value of 90 decibels (dB). Locally regulated noise levels may vary.

### PERMISSIBLE NOISE EXPOSURES

DURATION PER DAY, HOURS	SOUND LEVEL: DB(A) SLOW RESPONSE
8	90
6	92
4	95
3	97
2	100
1-1.5	102
1	105
0.5	110
0.25 or less	115

When employees are subjected to sound levels exceeding those listed above, feasible administrative or engineering controls should be utilized. If such controls fail to reduce sound levels within the levels of the table above, personal protective equipment must be provided and used to reduce sound levels to within the levels of the table.

**Note: In some jurisdictions the regulated noise levels could be less than 90 d-B. In such jurisdictions, the regulation noise levels must be respected.**

Exposure to impulse or impact noise should not exceed 140 dB peak sound pressure level. If the variations in noise levels involve maxima at intervals of 1 second or less, the noise is to be considered continuous.



## 29.1 AUDIOMETRIC TESTING PROGRAM

The company should establish and maintain an audiometric testing program by making audiometric testing available to all employees whose exposures equal or exceed a TWA of 85 decibels. The program should be provided at no cost to employees.

Audiometric tests are to be performed by a licensed or certified audiologist, otolaryngologist,, physician, or by a technician who is certified.

### 29.1.1 BASELINE AUDIOGRAM

Within 6 months of an employee's first exposure at or above the action level (TWA of 85 decibels), the company should establish a valid baseline audiogram against which subsequent audiograms can be compared.

Testing to establish a baseline audiogram must be preceded by at least a 14-hour period without exposure to workplace noise. Hearing protectors may be used as a substitute for the requirement that baseline audiograms be preceded by 14 hours without exposure to workplace noise.

#### ANNUAL AUDIOGRAM

At least annually after obtaining the baseline audiogram, the company should obtain a new audiogram for each employee exposed at or above a TWA of 85 decibels.

#### EVALUATION OF AUDIOGRAM

Each employee's annual audiogram should be compared to that employee's baseline audiogram to determine if the audiogram is valid and if a standard threshold shift has occurred.

Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the company must ensure that the following steps are taken when a standard threshold shift occurs:

- Employees not using hearing protectors are fitted with them, trained in their use and care, and required to use them.
- Employees already using hearing protectors will be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

## 29.2 STANDARD THRESHOLD SHIFT

A standard threshold shift is a change in hearing threshold relative to the baseline audiogram of an average of 10 Db or more at 2000, 3000, and 4000 Hz in either ear.

In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (prebycusis) to the change in hearing level by correcting the annual audiogram.



## 29.3 HEARING PROTECTORS



Companies should make hearing protectors available to all employees exposed to a TWA of 85 decibels or greater at no cost to the employees. Hearing protectors must be replaced as necessary.

### 29.3.1 TRAINING PROGRAM

A training program is mandatory for all employees who are exposed to noise at or above a TWA of 85 decibels.

The training program is to be repeated annually for each employee included in the hearing conservation program. Information provided in the training program should be updated to be consistent with changes in protective equipment and work processes.

**Each employee has to be informed of the following:**

- The effects of noise on hearing
- The purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instruction on selection, fitting, use, and care
- The purpose of audiometric testing, and an explanation of the test procedures

### 29.3.2 RECORD KEEPING

- **Exposure Measurements:** An accurate record of all employee exposure measurements must be maintained
- **Audiometric Tests:** The company should retain all employee audiometric test records obtained "Audiometric Testing Program".

**This record is to include:**

- Name and job classification of the employee
- Date of audiogram
- The examiner's name
- Date of the last acoustic or exhaustive calibration of the audiometer
- Employee's most recent noise exposure assessment



## 30. ERGONOMICS / HUMAN ENGINEERING

Sometimes called “human engineering”, Ergonomics is the study and design of jobs, work tasks, products, environments and systems in order to make them compatible with the needs, abilities and limitations of people and their bodies.

### 30.1 BIOMECHANICAL RISK FACTORS

Musculoskeletal injuries, or MSIs, are referred to by a variety of different names. They include repetitive strain injuries (RSIs), repetitive motion injuries, cumulative trauma disorders (CTDs), work-related upper limb disorders (WRULDs), and others. In each case, the name is used to describe injuries of the bones, joints, ligaments, tendons, muscles, and other soft tissues.

Although the causes of MSIs are difficult or sometimes impossible to determine, several risk factors have been shown to contribute them. Three major factors involving how a worker’s body functions during work which can contribute to injuries are:

- **Awkward body positions**
- **Excessive force (forceful exertions)**
- **Repetition**

#### 30.1.1 AWKWARD BODY POSITIONS

Awkward positions are often the result of the location and orientation of the object being worked on, poor workstation design, product design, tool design, or poor work habits.

Less-than-optimal postures such as leaning forward from the waist for extended periods of time, or bending the neck downwards at an exaggerated angle, can load muscles with “static work”. Static work involves muscles being tensed in fixed positions and over time, becoming tired, uncomfortable and even painful. Production line workers who have to bend their necks and hold them in one position often experience strain in their neck and shoulder muscles.

Sedentary work involving sitting or standing for long periods of time without movement can lead to pain and discomfort in the lower back.



*Correction of Awkward Body/Sitting Positions*



**Potential solutions:**

Awkward body positions and their effects can be reduced by:

- **Encouraging frequent changes of position.** This avoids becoming “locked” into one position for extended periods of time.
- **Avoiding forward and downward bending of the head and upper body.** This commonly occurs when tasks, work surfaces, or controls are too low relative to the worker’s standing or sitting position.
- **Avoiding having the arms held in a raised position,** either in front of the body or out to the sides with the elbows bent. Such positions are often the result of work surfaces or controls being too high relative to the worker’s standing or sitting position.
- **Avoiding twisted body positions.** Arrange the work and workstation so that twisting is avoided.
- **Avoiding positions that require a joint to be used for extended periods** of time at the limit of its range of motion, e.g. constant reaching behind the back can place considerable strain on the shoulder joint.
- **Providing adequate back support in all chairs or seats.** Back supports, preferably adjustable ones, improve posture, lessen fatigue, and make sitting for long periods of time more comfortable.
- **Optimizing the position of arms and legs.** Ensure that the arms and legs are positioned within their most favorable range of motion when muscular force needs to be exerted.

**30.1.2 FORCEFUL EXERTIONS**

Forceful exertions are commonly used when lifting, pushing, pulling and reaching. A packer on an assembly line for example may often use a highly forceful grip to assemble a lightweight item or lift a box or carton, especially if it is slippery or difficult to grasp. Forceful exertions may overload muscles, tendons, and ligaments.



*Correct position for heavy lifting*



### Potential Solutions

High muscular forces can be reduced by:

- **Reducing the forces required to perform the task**, e.g. using mechanical aids when lifting and handling materials, using jigs, vices, and clamps rather than hands to grip parts, keeping sharp edges of tools and equipment sharp, reducing contact forces on switches and controls, lubricating and maintaining tools and equipment.
- **Distributing forces**, e.g. using a larger body part, such as the arm rather than a finger, to deliver the force.
- Use the legs for lifting rather than the back.
- Use the feet to turn, rather than twisting the trunk of the body.
- **Establishing better mechanical advantage**, e.g. with larger, better positioned tools, with levers, or by involving larger muscle groups.

### 30.1.3 REPETITION

Repetitive movements eventually wear the body down. Without sufficient time to recover between repetitions, muscles become tired and may cramp. Other muscles try to help but they may also become tired, cramp, and become injured. How quickly this happens depends on how often a repetitive motion is performed, how quickly it is performed, and for how long the repetitive work continues. Repetitive work is more of a problem when it is combined with awkward body positions and forceful exertions.

### Potential Solutions

Work exposure to repetitive work and its effect can be reduced through:

- **Automation of task or portions of the task.** Machines are particularly effective at performing repetitive tasks.
- **Job rotation.** This breaks up a worker's exposure to a particular repetitive movement. It is extremely important that the new task involves different movements and muscle groups.
- **Job diversity.** Training workers to perform a series of properly selected jobs rather than the same, simple one repetitively reduces monotony, boredom, and the potential for injury. Jobs with greater diversity often provide workers with a sense of accomplishment.
- **Job enrichment.** Workers are given responsibility for a wider range of duties that require a variety of skills and qualifications. As examples, these duties may include work planning, inspection activities, or customer contacts.
- **Frequent breaks.** Frequent, short breaks from work activities provide workers an opportunity to recover from their activities by stretching, changing body positions, or relaxing hard-working muscles.



## **30.2 OTHER BIOMECHANICAL RISK FACTORS**

### **30.2.1 COMPRESSION AND IMPACT STRESS**

Tissues can become compressed when they come into contact with the edges of workbenches, tool handles, machine corners and poorly designed seating. Forces are concentrated on small areas of tissue, resulting in high localised pressure. This pressure can compress nerves, blood vessels, tendons and other soft tissues resulting in damage and injury.

Using the hand, for example, as a hammer is a form of external tissue compression known as impact stress. Hand hammering can damage one of the arteries that pass through the wrist and palm, eventually affecting the function of the thumb.

### **30.2.2 HAND-ARM VIBRATION**

Hand-arm vibration is vibration transmitted to the arms through the hands. It can damage both the small blood vessels and small nerves of the fingers, resulting in two specific injuries: vibration-induced white finger and vibratory neuropathy. Together, these injuries are known as the hand-arm vibration syndrome (HAVS) and result in numbness, loss of finger coordination and dexterity, clumsiness and an inability to perform fine motor tasks. Blanching or loss of color in the skin usually starts at the tips of the fingers but progresses as exposure time increases. The most important sources of vibration due to tools include grinders and drills. In footwear factories, for example, special attention should be given to mid-sole and upper roughing.





## 31. CHILDREN'S RIGHTS AND THE WORKPLACE

Companies should respect and support children's rights as well as promote a family-friendly workplace. They should be a responsible employer of young people of legal working age and promote decent youth employment.

Three ways that can promote children's rights in the workplace are:

- **Establishing a family-friendly workplace**
- **Addressing and preventing child labor**
- **Respecting the rights of young workers**

### 31.1 FAMILY FRIENDLY WORKPLACE

Bata can make an important contribution to children's rights by establishing family-friendly workplaces where employees are supported in meeting both their work commitments and family responsibilities.

- Understand the meaning of an adequate living wage in your country situation and ensure the provision of decent working conditions to your employees.
- Create a mother-friendly work environment.
- Provide appropriate childcare facilities for working parents.
- Take into account the needs of workers with family responsibilities.
- Ensure that employee housing and services are safe and suitable for resident children.

### 31.2 ADDRESSING AND ELIMINATING CHILD LABOUR

- Establish a child-friendly age verification mechanism.
- Where you discover cases of children employed in violation of minimum-age provisions, take responsible action to rectify them.
- Examine your internal business behavior to avoid making demands of suppliers or sub-contractors that may lead them to use child labor.
- Exert your influence on supply chains and sub-contractors to eliminate child labor throughout their business operations.
- Ensure that salaries paid offer adequate living wages to workers i.e. the national minimum wage plus additional payments such as sick pay, overtime pay and social contributions.
- Create and communicate a company policy prohibiting your employees from hiring children as domestic workers, who are not of working age.
- Take an active role to eliminate poverty in the communities where your company is operating, as part of the fight against child labor.



### 31.3 RESPECTING THE RIGHTS OF YOUNG WORKERS

Not all work carried out by a child is child labor. 'Young workers', are those above the legal working age and under 18 years. The international minimum age for full time, non-hazardous work is 15. National standards may be higher.

- At a minimum you need to follow the applicable national rules regarding young workers and hazardous work.
- Create internal guidelines to protect young workers.
- Establish policies and practices to prevent, identify and investigate alleged trafficking, abuse, intimidation, harassment, sexual exploitation and labor exploitation of young workers.
- Maintain a record of all employees under the age of 18.
- Provide young workers with regular age appropriate health care, monitoring and treatment.
- Provide suitable accommodation and supervision for young workers.
- Remove obstacles and make concrete efforts to encourage and assist young workers to combine work and education.
- Take actions to ensure that young workers understand and have access to their labor rights.
- Make sure that the salary for young workers is sufficient for an adequate standard of living.



## 32. WORK RELATED STRESS

Stress can cause misery, both at work and at home for the individuals affected. However, it can also affect the whole workplace. Low morale and productivity, increased levels of absenteeism, high staff turnover, lack of innovation and poor safety performance are a few of the “workplace” symptoms to which stress can give rise.

It is generally believed that some stress is acceptable (sometimes referred to as “challenge “or “positive stress”) but when stress occurs in amounts that an individual cannot handle, both mental and physical changes may occur.

### 32.1 SYMPTOMS OF STRESS

There is a range of physical, psychological and behavioral symptoms experienced if faced with high levels of stress.

PHYSICAL EFFECTS	PSYCHOLOGICAL EFFECTS	BEHAVIORAL EFFECTS
<ul style="list-style-type: none"> <li>• Increased blood pressure</li> <li>• Increased heart rate</li> <li>• Increased muscle tension</li> <li>• Headaches</li> </ul>	<ul style="list-style-type: none"> <li>• Increased anxiety</li> <li>• Depression</li> <li>• Aggression</li> <li>• Confusion</li> </ul>	<ul style="list-style-type: none"> <li>• Increased smoking</li> <li>• Increased drinking</li> <li>• Irritability</li> <li>• Obsessive concern with trivial issues</li> <li>• Poor work performance</li> </ul>

Effects of stress on the body can be divided into two categories:

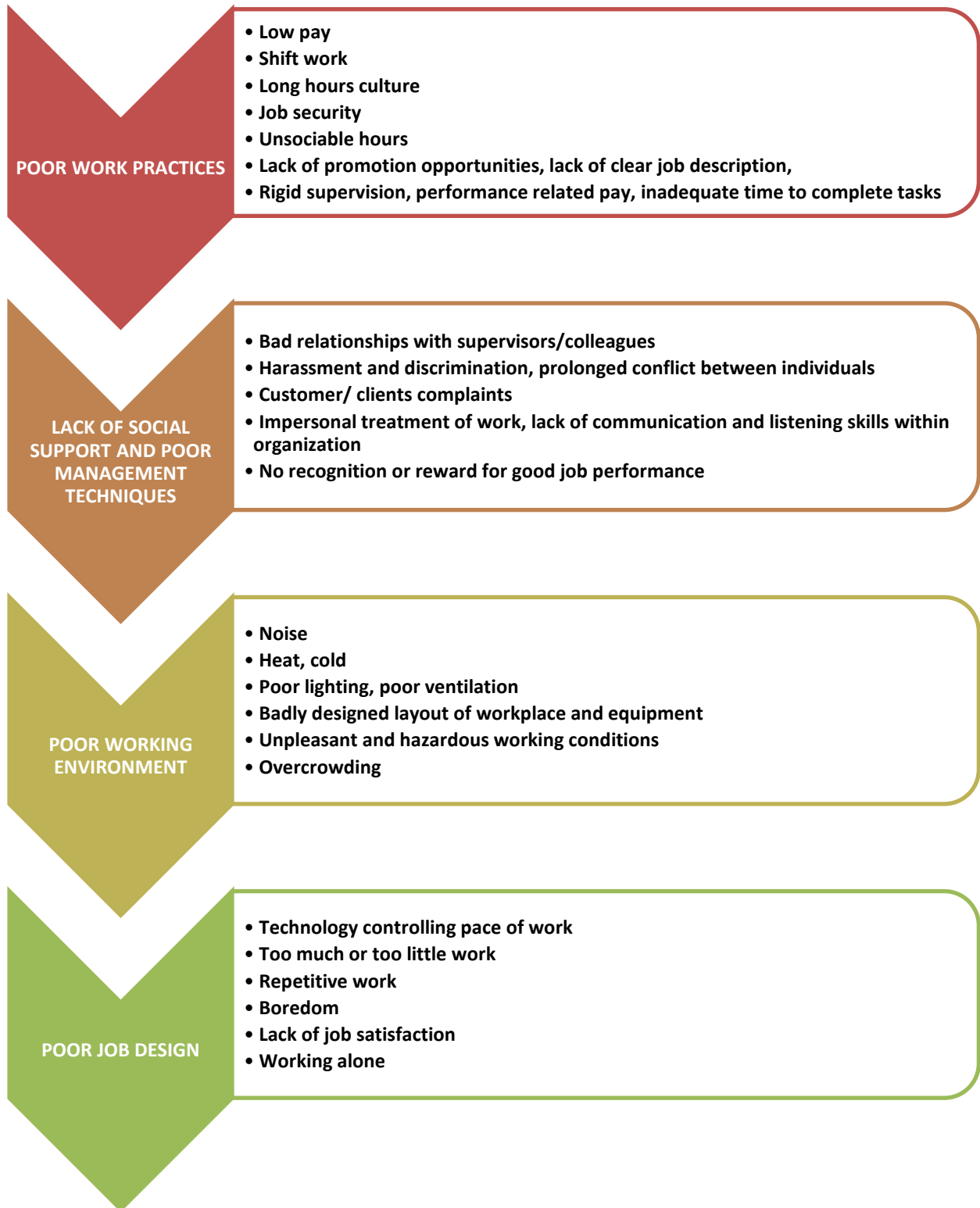
SHORT TERM	LONG TERM
<ul style="list-style-type: none"> <li>• Anxiety, boredom</li> <li>• Headaches, fatigue</li> <li>• Indigestion, heartburn</li> <li>• Dry mouth, lump in throat</li> <li>• Irritability, depression</li> <li>• Muscular tension, pain, difficulty sleeping</li> <li>• Dry skin and rashes</li> </ul>	<ul style="list-style-type: none"> <li>• Neurosis</li> <li>• Insomnia</li> <li>• Hypertension and chest pains</li> <li>• Cough and asthma</li> <li>• Gastrointestinal disorders, ulcers</li> <li>• Impotence in men and menstrual disorders in women</li> </ul>

The help of medical and psychological professionals is highly recommended when stress starts to impact the health and wellbeing of the employee.

## 32.2 JOB CONDITIONS THAT MAY LEAD TO STRESS

In order to reduce stress at work it is necessary to find the causes of the problems.

Listed below are some of the more common known causes of stress.





## 32.3 MANAGEMENT OF WORKPLACE STRESS

Stress at work can be tackled in the same way as any other risk to health by:

- Identifying the hazards
- Assessing who is at risk and the level of risk
- Deciding how to manage the risk and putting the plans into action

**Benefits to tackling stress can include:**

- Increased productivity and efficiency
- Lower staff turnover and sickness absence
- Increased morale

### 32.3.1 STRESS POLICY

A stress policy is a useful mechanism to reduce and prevent occupational stress. It is essential that such policies are developed and monitored jointly by management and employees.

The objectives of the policy should be to prevent stress by identifying the causes and eliminating them, to deal with problems as they arise, to promote openness and guarantee a “*blame free*” culture, and rehabilitation of employees suffering from stress through confidential independent counseling.

**The effective stress policy must:**

- Recognize stress as an occupational health and safety issue
- Set out who is responsible for preventative measures
- Identify who to contact in the event of a problem arising
- Set out organization’s work patterns and acceptable working hours
- Have commitment from the top level of management in the company
- Identify systems and procedures to deal with and monitor stress

The key to the implementation of a work-related stress policy is risk assessment. Stress must be treated like any other preventable workplace hazard.

### 32.3.2 REHABILITATION AND SUPPORT FOR STRESSED WORKERS

Employee Assistance Programs (EAPs) can help manage stress at work and at home. These programs are set up to handle personal and emotional problems which are interfering with work performance. Stress from outside the workplace such as family illness or death, marital problems or financial concerns can all interfere with work lives. An EAP will not solve these problems but it can give advice on managing these stressful situations.



### 32.3.3 HEAT STRESS

Certain locations and processes in a factory may present a risk of heat stress and heat-related disorders to workers. Heat stress refers to the net heat load which the workers are subjected to form a variety of sources:

- Workload or physical activity
- Air temperature and humidity; the extent of air movement in the vicinity
- Radiant heat sources such as the sun or hot equipment, and the clothing requirements of the job
- Low liquid intake

#### SYMPTOMS OF HEAT EXHAUSTION

- Headache, dizziness, or fainting
- Weakness and wet skin
- Irritability or confusion
- Thirst, nausea, or vomiting

#### SYMPTOMS OF HEAT STROKE

- May be confused, unable to think clearly, pass out, collapse, or have seizures (fits)
- May stop sweating

#### RECOGNITION OF HEAT STRESS IN WORKERS: BASIC MEDICAL SURVEILLANCE

- Core body temperature  $>38^{\circ}\text{C}$  (oral temperature  $>37.5^{\circ}\text{C}$ )
- Sustained pulse rate over several minutes of  $[180 - \text{worker age}]$  beats per minute
- Recovery pulse rate one minute after peak work effort of  $>110$  beats per minute
- Weight loss during a single work shift of  $>1.5\%$  of body weight

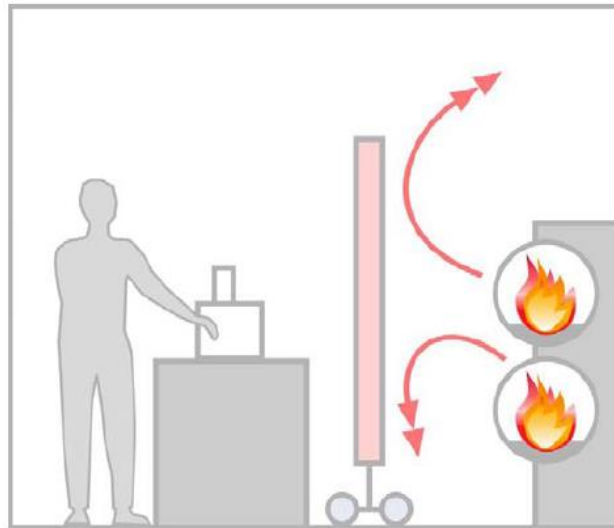
To combat these factors that contribute to heat stress, there are two primary and related mechanisms by which heat is removed from the body:

- **Evaporation of sweat**
- **Convection** which is a function of air temperature and air speed. Convective cooling (i.e. blowing air past a worker) only occurs when the air temperature is less than the skin temperature of the worker. When the air temperature exceeds skin temperature, blowing air at worker adds to the heat stress.



**HOW TO PROTECT WORKERS**

- Rest breaks in a cooler environment and/or job rotation in the hot environment
- Cooling vests or other water-cooled garments
- Shielding of radiant heat sources



*Sheltering from radiant heat*

- Establish a complete heat illness prevention program
- Provide training about the hazards leading to heat stress and how to prevent them
- Gradually increase workloads and allow more frequent breaks for workers new to the heat or those that have been away from work to adapt to working in the heat (acclimatization)
- Designate a responsible person to monitor conditions and protect workers who are at risk of heat stress

**Make sure your workers follow the following recommendations:**

- Know signs/symptoms of heat illnesses; monitor yourself; use a buddy system.
- Block out direct sun and other heat sources
- Drink plenty of fluids. Drink often and BEFORE you are thirsty. Drink water every 15 minutes
- Avoid beverages containing alcohol or caffeine
- Wear lightweight, loose-fitting clothes





**WHAT TO DO WHEN A WORKER IS ILL FROM THE HEAT**

- Call a supervisor for help. If the supervisor is not available, call the emergency number.
- Have someone stay with the worker until help arrives.
- Move the worker to a cooler/shaded area.
- Remove outer clothing.
- Fan and mist the worker with water; apply ice (ice bags or ice towels).
- Provide cool drinking water, if able to drink.

**IF THE WORKER IS NOT ALERT** or seems confused, this may be a **heat stroke**. CALL the emergency number and apply ice as soon as possible.





### 33. WORKPLACE VIOLENCE

Workplace violence is a serious and deadly hazard; one that can cause not only physical injury, but serious psychological damage as well.

Most think of violence as a physical assault. However, workplace violence is a much broader problem. It is any act in which a person is abused, threatened, intimidated or assaulted in his or her employment.

**Workplace violence may include:**

#### THREATENING BEHAVIOR

- such as shaking fists, destroying property or throwing objects.

#### VERBAL OR WRITTEN THREATS

- any expression of intent to inflict harm.

#### HARASSMENT

- any behavior that demeans, embarrasses, humiliates, annoys, alarms or verbally abuses a person and that is known or would be expected to be unwelcome. This includes words, gestures, intimidation, bullying, or other inappropriate activities.

#### VERBAL ABUSE

- swearing, insults or condescending language.

#### PHYSICAL ATTACKS

- hitting, shoving, pushing or kicking.



Workplace violence (WPV) incidents can be divided into categories depending on the relationship between the assailant and the worker or workplace.

These categories are:

#### VIOLENCE BY STRANGERS

- In this type of incident the violence is committed by a stranger. This stranger has no legitimate relationship to the worker or workplace and enters the workplace, usually on the pretense of being a customer, to commit a robbery or other violent act.

#### VIOLENCE BY CUSTOMERS / CLIENTS

- The violence can be committed in the workplace or, as with service providers; outside the workplace but while the worker is performing a job related function.

#### VIOLENCE BY CO-WORKERS

- In co-worker incidents, the perpetrator has an employment relationship with the workplace. The perpetrator can be a current or former employee, a prospective employee, a current or former supervisor or a manager.
- Co-worker violence that occurs outside the workplace, but which resulted or arose from the employment relationship would be included in this category.

#### VIOLENCE BY PERSONAL RELATIONS

- In personal relations incidents, the violence is committed by someone who has a personal relationship with the worker, such as a current or former spouse or partner, a relative or a friend. Included in this category is the perpetrator who has a personal dispute with the worker and enters the workplace to harass, threaten, injure or kill.



### 33.1 WORKPLACE VIOLENCE PREVENTION PROGRAM

A written WPV Prevention Program should be maintained. It will be made available to all employees and all employees are to receive specific training concerning its content and implementation.

The program should reflect the level and nature of threat faced by the employee(s) / employer. The potential for and/or source(s) of violence in a specific workplace requires a review and assessment of the vulnerability to the four (4) categories of violence previously outlined; Violence by Strangers, Client/Customers, Co-workers and Personal Relationships.

**Elements of a WPV Prevention Program include:**

- Workplace Violence Policy Statement
- Establish a Threat Assessment Team
- Risk Assessment
- Workplace Hazard Control and Prevention
- Training and Education
- Incident Reporting, Investigation
- Recordkeeping

#### 33.1.1 WORKPLACE VIOLENCE POLICY STATEMENT

An important element of an effective program for prevention of workplace violence is a clearly written company policy statement which demonstrates top management's concern and commitment to their employees' safety and health.

**The written policy should state that Bata:**

- Will provide a safe and secure work environment for employees, visitors, and contractors from acts of violence in the workplace.
- Prohibits all types and levels of violence in the workplace and are unacceptable and will not be tolerated.
- That acts of violence will subject employee to disciplinary action up to and including the possibility of dismissal.
- Prohibits all weapons in the workplace.
- Includes and encourages employee participation in the design and implementation of its workplace violence prevention program.
- Requires prompt and accurate reporting of violent incidents, whether or not physical injury has occurred.
- Will not discriminate against victims of workplace violence.



### 33.1.2 THREAT ASSESSMENT TEAM

The initial step in developing a workplace violence prevention program is to designate a Threat Assessment Team.

The Threat Assessment Team should be designated to assess the vulnerability to workplace violence and reach agreement on preventive actions to be taken. The team should also be responsible for:

- recommending/implementing employee training programs on workplace violence
- implementing plans for responding to acts of violence
- communicating internally with employees

**Threat Assessment Team membership should include representatives of the following:**

- Senior management
- Operations
- Employees or their representatives
- Security
- Finance
- Legal
- Human resources

Responsibility for auditing the overall WPV prevention program should rest with the Threat Assessment Team.

### 33.1.3 RISK ASSESSMENT

A risk assessment is to be performed in any workplace in which a risk of injury to workers from violence arising out of their employment may be present.

The elements of a risk assessment should include records review, workplace security analysis and workplace surveys. The risk assessment must also include the consideration of:

- previous experience in that workplace
- occupational experience in similar workplaces
- the location and circumstances in which work will take place



### 33.1.4 WORKPLACE HAZARD CONTROL AND PREVENTION

The Threat Assessment Team should identify and institute a combination of control methods designed to eliminate or minimize the risks of assault incidents. These include, but are not limited to:

- general building, work station and area design, security measures
- security consideration
- work practice controls and procedures

These sample control measures can be implemented alone or in combination to address hazards identified in the hazard assessment.

#### **GENERAL BUILDING, WORKSTATION AND AREA DESIGNS:**

- Architectural design criteria which would eliminate or minimize structural susceptibility to violent acts. Examples could include relocation of the reception desk to provide the attendant a clear view of the entrance.
- Review the design of all new or renovated facilities to ensure safe and secure conditions for employees.
- Control access to employee work areas (use of locked doors, buzzers, card access, etc.)
- Provide appropriate lighting systems for all indoor building areas as well as grounds around the facility and in parking areas.
- Security should not conflict with Life Safety Code requirements. Although it may be tempting to keep doors locked to prevent intrusion, egress from inside the building must not be impeded.

#### **SECURITY CONSIDERATION:**

Security measures will be dependent upon the assets at risk. Each of the following concepts has application to an operation:

- Utilize Electronic Alarm Systems activated visually or audibly.
- Utilize Closed Circuit Television which permits security guards to monitor high risk areas, both inside and outside the building.
- Utilize cellular telephones, beepers, CB radios or hand-held alarms or noise devices in field situations.
- Examine and maintain security equipment on a regular basis to ensure its effectiveness.
- Procedural considerations such as visitor control programs; after hours of operations; evaluation of incoming packages; or vendor access.
- Physical security (target hardening), focus on physical or artificial barriers to minimize opportunities. The main lobby, parking areas, loading docks, stairwells and building tenants should be considered in these evaluations.



**WORK PRACTICE CONTROLS AND PROCEDURES:**

- Develop written procedures for employees to follow when entering any locations where they feel threatened or unsafe.
- Provide information and give assistance to employees who are victims of domestic violence and develop procedures to ensure confidentiality and safety for affected employees.
- Train employees on awareness, avoidance, and action to take to prevent mugging, robbery, rapes and other assaults.
- Modify existing work practices that are identified by the hazard assessment where employees face increased risk of violence.

**33.1.5 EMPLOYEE TRAINING AND EDUCATION**

All employees, regardless of their level of risk, should be taught:

- Techniques for recognizing the potential for violence
- Procedures, policies and work environment arrangements developed to control the risk to workers
- Proper use of security hardware
- The appropriate response to incidents of violence, including emergency and hostage situations
- Procedures for reporting, investigating and documenting incidents of violence

**EFFECTIVE TRAINING:**

- Is given in languages spoken by the employees,
- Provides sufficient time for questions and answers,
- Is conducted by trainers knowledgeable or qualified in their field of expertise,
- Is conducted before taking a new job assignment, annually or when laws, regulations or procedures change.

Managers and supervisors should be trained to behave compassionately towards co-workers when an incident does occur.



### 33.1.6 INCIDENT REPORTING, INVESTIGATION

#### INCIDENT REPORTING

A procedure for reporting violent incidents should be in place. This procedure should apply to all types of violent incidents and should be in writing and be easily understood by all employees.

Moreover, it should take into account issues of confidentiality. Employees may be reluctant to come forward otherwise. Employees should not fear reprisal for bringing their concerns to management's attention.

#### **Once an incident occurs, the employer should:**

- Report it to the local police department if required by law.
- Secure work areas where disturbances occurred.
- Ensure the physical safety of employees and others remaining in the area as soon as possible.
- Quickly assess the work area, if it was disturbed or damaged during an incident, to determine if it is safe.
- Provide critical incident debriefing to victims, witnesses and other affected employees; these conversations must be strictly confidential.

#### INCIDENT INVESTIGATION:

After an incident occurs, a detailed investigation is imperative. A delay of any kind may cause important evidence to be removed, destroyed intentionally or unintentionally.

#### **When conducting the investigation, the Threat Assessment Team should:**

- Collect facts on who, what, when, where and how the incident occurred.
- record information.
- Identify contributing causes.
- Recommend corrective action.
- Encourage appropriate follow-up.
- Consider changes in controls, procedures, policy.



### 33.1.7 RECORDKEEPING

An effective recordkeeping system helps to prevent recurrence and in determining required training. Records should be kept up to date.

The following records should be kept:

#### INCIDENTS OF ASSAULTS

- should describe who was assaulted, the type of activity, (i.e. unprovoked sudden attack), and all other circumstances of the incident. The records should include a description of the location/environment, potential or actual costs, lost time, nature of injuries sustained, etc.

#### INCIDENTS OF ABUSE, VERBAL ATTACKS OR AGGRESSIVE BEHAVIOUR

- any acts of aggression should be recorded; they may be threatening to the worker, but may not result in injury, (i.e. pushing or shouting). These records may be assault incident reports that are evaluated routinely by the Threat Assessment Team.

#### MINUTES OF SAFETY MEETINGS AND INSPECTION REPORTS

- training records - which should include dates the training was conducted, type of training given, employees trained, etc.

#### INSPECTION RECORDS

- which should include dates of inspection, areas inspected, all findings and recommendations, any control measures implemented, etc.

#### DOCUMENT ALL APPLICANT EVALUATION STEPS

- verification of past employment, academic or professional accreditation, drug screening, and additional background checks. Have applicants interviewed by at least two individuals

#### EMPLOYEE QUESTIONNAIRES

- that assess their views of high risk work areas and activities.

#### INSURANCE RECORDS

#### WORKERS' COMPENSATION RECORDS

#### MEDICAL RECORDS





## SECTION 8 - EMERGENCY PLANNING AND BUSINESS CONTINUITY PLAN





### 34. EMERGENCY PLANNING & RESPONSE

The emergency response is a strategic topic to reduce severity of a loss. A prepared and tested procedure makes the emergency response more efficient.

Emergency Response shall be defined and tested to that intervention is quick, efficient and controlled. Indeed, unprepared emergency response could be useless and, moreover, could lead to a new accident. For example, a lot of injuries has been reported for people trying to remove someone else from a toxic atmosphere or for firemen being injured on energized electrical installations.

#### EXAMPLE OF FIRE SAFETY INSTRUCTIONS DISPLAYS:



#### EXAMPLE OF EVACUATION PLAN AND ASSEMBLING POINT:





## 34.1 EMERGENCY RESPONSE PLAN

An Emergency Response Plan (ERP) establishes written procedures for all potential emergencies that could reasonably occur. It addresses responsibilities, pre-planning, inspections and training for the prevention of incidents, and for the emergency itself. It also outlines the sequence of response steps including an evacuation, emergency actions, clean-up and the subsequent follow ups - documentation and/or review of procedures.

The main emphasis in the ERP will be to prevent any major accidents, be it a **fire, explosion, chemical spill, medical or any other preventable incident**, by preplanning, inspection, training and immediate response.

However, should an emergency occur, the objective will be to **minimize the consequences of the emergency** by a proper and orderly evacuation and to:

- Prevent fatalities and/or injuries
- Reduce damage to equipment, stock, and building
- Accelerate the resumption of normal operations

The ERP should be formally **reviewed at least once per year** and updated as required.

**The Emergency Response Plan (ERP) should include:**

- An Evacuation Plan
- Fire Safety Plans (approved by local fire authorities)
- Anticipated Natural Disasters (Earthquake, Severe Weather, Hurricane, Flood, Tornado, Blizzard)
- Operational or Technological Emergencies (Chemical Spills, building collapse)
- Miscellaneous Emergencies (Terrorism, Riot/Civil Disturbance, Bomb Threat)

### 34.1.1 CONTENTS OF THE ERP

Conduct a Vulnerability Analysis to assess the probability and potential impact of each potential emergency from the Hazard Profile;

- Assign responsibilities
- Develop written procedures
- Take appropriate preventive measures
- Training: ensure all employees are aware of the proper procedures
- Perform regular drills
- Conduct regular inspections
- Develop maps and/or location diagrams of response equipment



### 34.1.2 RESPONSIBILITIES

#### EMERGENCY RESPONSE TEAM COORDINATOR

The duties of the Emergency Response Team Coordinator who could be the EH&S Coordinator, should include the following:

- Develop the Emergency Response Plans, including evacuation, fire, power failure, personnel injury, and natural disasters.
- Assessing the situation and determining whether an emergency exists that requires activating the emergency procedures.
- Directing all efforts in the area including evacuating personnel and minimizing property loss.
- Ensuring that outside emergency services such as medical aid and local fire departments are called in when necessary.
- Directing the shutdown of operations when necessary.
- Has the "ALL CLEAR" authority during any evacuation.
- Appoint Supervisory Staff to carry out duties as assigned in the ERP Checklist.
- Instruct Supervisory Staff and all Associates including new hires, so they are aware of their responsibilities as assigned in the ERP Manual.

#### EMERGENCY RESPONSE TEAMS

Emergency Response Teams are the first line of defence. Before assigning personnel to these teams, the Emergency Response Team Coordinator must ensure that employees are physically capable of performing their duties. Teams should consist of employees trained in:

- Use of various types of fire extinguishers
- First aid, including Cardio-Pulmonary Resuscitation (CPR)
- Shutdown procedures
- Evacuation procedures
- Chemical spill control procedures
- Use of Self-Contained Breathing Apparatus (SCBA)
- Search and emergency rescue procedures

They should be informed about special hazards, such as storage and use of flammable materials, toxic chemicals, and water-reactive substances, to which they may be exposed during fires and other emergencies.

It is important to determine when not to intervene. For example, team members must be able to determine if the fire is too large for them to handle or whether search and emergency rescue procedures should be performed.



The Emergency Response Teams are divided in two teams: the FIRST INTERVENTION TEAM (F.I.T.) and the SECOND INTERVENTION TEAM (S.I.T.)

### **Example of the response teams actions during a fire**

#### **FIRST INTERVENTION TEAM (F.I.T.)**

The first intervention has to be done by personnel close to the location of fire origin. It is important that personnel are trained to attack the fire with suitable extinguishers.

#### **The main tasks of the First responders in case of fire are:**

- Trigger the fire or general alarm
- Evacuate the people to a safe place
- Call the fire department
- Welcome the fire department
- Use all appropriate equipment (e.g. extinguishers, fire hoses, security barriers and site access, first aid and medical supplies, spill containment, etc.) to control or to suppress the emergency during its incipient stages. It must be stressed that employees shall not be exposed to undue risk.
- Safety instructions must be drawn up for guards during periods of inactivity in order to minimize internal/external delays of intervention in case of an alarm and/or an accident. Procedures must be tested regularly, and the guards trained in intervention.

#### **SECOND INTERVENTION TEAM (S.I.T.)**

This team attends regular training on equipment and procedures (**minimum twice a year**). It is recommended that three persons are trained to use all the means of protection in place and one person should be an electrician/fluid responsible.

In case of shifts (2x8, 3x8, etc.), several teams must be built, and back-up must be identified.

Hereafter, an example of the team composition in case of a fire incident:

#### **This Second Intervention Team must comprise:**

1. An officer responsible for directing the Second Intervention Team. He will direct operations and ensure that all necessary tasks are accomplished, starting with calling the fire brigade.
2. A person responsible for greeting the fire-fighters when they enter on to the premises and directing them to the location of the incident.
3. People responsible for fire-fighting, by means of monitors and mobile extinguishers. These persons must be adequately trained and do practical exercises at least once per semester.
4. An electrician to switch off/disconnect electrical equipment
5. A person responsible for shutting of the main gas valve and disconnecting the affected zone.
6. Where applicable, a person responsible for shutting off other equipment (air conditioning, hydraulic equipment).



7. A recovery team charged with saving critical property under threat, where this does not present any danger.

**If the establishment is protected by sprinklers, the following should also be available:**

- A person in charge of the sprinkler control valves: once the fire alarm is received, he will go directly to the valve that controls the sprinklers in the affected area, to make sure that it is open. Where this does not present any danger, he will remain close to the valve to ensure that it stays open as long as the fire lasts. He will not close this valve until he has received the instruction from a member of the fire department.
- A person in charge of the fire pumps as soon as the fire alarm is received. He will go immediately to the fire pump and start the pump if it has not started automatically. This person will remain nearby to ensure that it operates properly. When the fire is out, he must refill the fuel reservoir (for diesel pumps) and the water reservoir, and then reset the fire pump to the automatic start position.

Note that the team must also be trained to the response to natural hazards (floods, storms, earthquakes, heavy rain). The names of members and replacements, together with their duty, will be written in **the Emergency Response Plan** and displayed.

### **SUPERVISORS**

- Know their designated work areas
- Are familiar with the procedures to be followed in an emergency

### **EMPLOYEES**

- Know their designated assembly areas.
- Are familiar with the procedures to be followed in an emergency.
- Know who their Supervisor are for your work area.
- Know locations of emergency equipment, including pull station alarms, fire extinguishers and hoses, first aid room and equipment, telephone, etc.
- Know the evacuation / fire alarm signals and the procedures to follow thereafter.
- Report any condition(s) which may be a fire hazard to their Supervisor (faulty/damaged alarm components, blocked emergency exits, missing or used fire extinguishers, chemical spills, fire hazards, etc).



### 34.1.3 TRAINING

**In addition to the specialized training for Emergency Response Team members, all employees should be trained in the following:**

- Evacuation plans
- Alarm systems
- Reporting procedures for personnel
- Shutdown procedures
- Types of potential emergencies

**These training programs should be provided as follows:**

- Initially when the plan is developed
- For all new employees
- When new equipment, materials, or processes are introduced
- When exercises show that employee performance must be improved
- At least annually

**Instructions should also be provided to:**

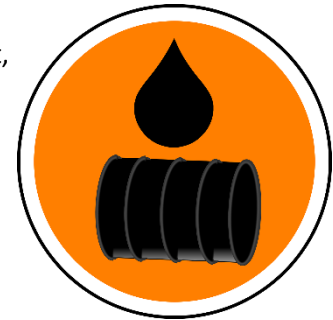
- Visitors to the company
- Contractors (including cleaners, grounds-keepers; cafeteria vending services, etc.)



## 34.2 SPILL PREVENTION CONTROL PLAN

A spill prevention control and countermeasure plan should identify proactive measures to prevent a spill from occurring or reaching the environment.

When developing your plan, make it specific to your facility's layout, storage and key contacts. It should include:



### 1. Operating procedures that prevent oil spills

Employees are trained to implement spill prevention practices for work with and around oil sources. This section of your plan outlines best practices, recommendations and training procedures such as:

- a. **Storage instructions**  
(do not store oil sources near catch basins or floor drains)
- b. **Management practices**  
(always have supervision during the loading and unloading of petroleum products)
- c. **Product recommendations**  
(use pads, drip pans and funnels when transferring petroleum products from a portable container)
- d. **Layout maps**  
(facility map that denotes location and contents of each container, tank, transfer station and piping)

### 2. Control measures to prevent a spill from reaching the environment

Identify the types and locations of spill-containment products in order to quickly control a spill.

For example, maintaining stocked spill kits at spill-prone locations, and ensuring this is documented within your plan, can increase the likelihood that responders will be able to handle a spill before it becomes reportable. It also is important to keep a combination of absorbent products stocked and onsite, such as booms and pads.

### 3. Countermeasures to contain, clean up and mitigate the effects of an oil spill that reaches the environment.

When a spill is not prevented from reaching the environment, quick-response countermeasures need to be in place. Facilities should identify proper evacuation policies, authorized employees for cleanup and contact information.

A detailed plan can positively contribute to improved housekeeping practices and controlled spills and discharges.





## 35. EMERGENCY PROCEDURES

### 35.1 FIRE SITUATIONS

#### IN THE EVENT OF A FIRE ALARM

- STOP all equipment or machines you are operating in a safe and controlled manner. Specific emergency shut down instructions should be prepared for machinery which can be damaged by a sudden shutdown and operatives must be instructed in the fastest safe shut down procedure to be used in emergencies
- Immediately leave the building via the nearest emergency exit.
- WALK - DO NOT RUN
- Do not stop for personal items
- Proceed directly to your assigned Assembly Areas
- Do NOT re-enter the building unless the Emergency Coordinator gives the ALL CLEAR

#### IF YOU ARE IN THE FIRE AREA

- Leave the fire area immediately
- Close doors and windows if safety permits behind you
- If doors are encountered along the way to the exit, feel door for heat before opening. If not hot, brace yourself against door and open slightly.
- If you feel hot air, immediately close the door and proceed to an alternate exit. If necessary, stay low (crawl).
- Evacuate the building

#### IF YOU DISCOVER A FIRE

- IMMEDIATELY LEAVE THE FIRE AREA
- PULL / ACTIVATE THE NEAREST FIRE ALARM
- NOTIFY SECURITY AND/OR FRONT DESK BY DIALLING the internal phone system emergency call number
- EVACUATE THE BUILDING



### FIRE EXTINGUISHER USE

There are four very important points to remember before you reach any fire extinguisher to fight a fire:

1. How the extinguisher works
2. What is burning
3. What class of extinguisher you need
4. The types of fires the extinguisher is designed to handle

If you are confident you are able to use a fire extinguisher and the fire is small, you may try to fight it **AFTER** you have reported it and **PULLED** the fire alarm. Inform Security or your Supervisor of fire location and that you are going to fight fire.

To fight a small fire, remember the **PASS Technique**:

- P** - Pull pin and break the seal from the extinguisher.
- A** - Aim the nozzle at the base of the fire.
- S** - Squeeze/press the trigger.
- S** - Sweep side-to-side at the base of the fire using a steady stream, not short bursts, until the fire is extinguished.

If the fire becomes too large or out of control, leave area immediately. Close doors behind you as you leave.

Always ensure an **ESCAPE ROUTE** while you are fighting fire.

In the event of a solvent or petroleum fire be aware of the potential for an explosion and rapid spread of a fire which could block your escape route

If there are containers of flammable materials close to the fire, either remove them to a safer location **AT NO RISK TO YOURSELF** or use a water hose to keep them cool - to prevent heat / pressure build-up.

Under no circumstances should water be directed onto a solvent or petroleum fire and extreme care must be exercised using a water jet close to a solvent or petroleum fire.

If for any reason you feel you are unable to fight a fire which becomes too large or the smoke too intense - **LEAVE THE AREA IMMEDIATELY. DO NOT TRY TO BE A HERO. SMOKE IS THE GREATEST DANGER IN A FIRE AND DO NOT TRY AND FIGHT A CHEMICAL FIRE WITHOUT PROTECTIVE EQUIPMENT INCLUDING SELF CONTAINED BREATHING APARATUS. THE GASSES FROM CERTAIN CHEMICAL FIRES ARE FATAL IN SECONDS. PROFESSIONAL FIRE FIGHTING PERSONNEL SHOULD BE ADVISED OF PRESENCE OF HAZARDOUS CHEMICALS AND THE MSDS's FOR CHEMICALS MUST BE IMMEDIATELY AVAILABLE TO FIREFIGHTERS**

Proceed directly to your Assembly Area.

Inform the Emergency Coordinator of fire location and current conditions.



**CHEMICAL SPILL PROCEDURES**

**1. SMALL SPILLS**

- A. Small spills of any chemical (i.e. less than 100 ml.) can be safely picked up using the absorbent pads (absorbs 10 times its own weight).
- B. Absorbent pads are located in Maintenance and in the factory office.
- C. Wear chemical-resistant gloves when picking up soaked pads and dispose of in sealed plastic bags.
- D. Flush spill area with water.

**2. LARGE LIQUID SPILLS**

- A. Extinguish all sources of ignition.
- B. Notify Supervisor and Maintenance.
- C. Wear chemical-resistant gloves and goggles.
- D. Dyke spill to prevent entry into drains or sewers with "socs" (long bags filled with sand to build dyke).
- E. Ventilate area, if necessary.
- F. Cover spill with particulate absorbent or pads.
- G. If necessary, remove other chemicals in immediate area.
- H. Use a scoop or shovel, collect absorbent into a container or plastic bag for disposal.
- I. Dispose of container or bag by calling licensed waste disposal hauler.
- J. Flush spill area with water.
- K. Consult the MSDS for additional information.
- L. Conduct an accident investigation to determine cause of the spill and to prevent a repeat occurrence.

**3. RELEASE OF TOXIC SUBSTANCES:**

IN A FIRE INVOLVING SOME RAW MATERIALS USED IN FOOTWEAR MANUFACTURE AND IN THE FOOTWEAR MANUFACTURED USING FREQUENTLY USED MATERIALS TOXIC GASES CAN BE GENERATED IN THE EVENT OF A FIRE.

The smoke generated from a polyurethane foam fire is highly toxic.

**Chemical storage includes:**

- 200 L drums of lubricating oils (non-hazardous)
- Polyurethane chemical compounds
- Solvents - MEK, Toluene, Methylene Chloride, etc.
- Tannery chemicals and electroplating acids, electro-erosion or acid erosion
- List all chemicals which are labelled toxic or hazardous as listed in the MSDS.



- A. Notify your Supervisor or Security immediately.
  - DO NOT SOUND THE FIRE ALARM
  - DO NOT SWITCH OFF OR DISCONNECT ELECTRICAL EQUIPMENT OR UTILITIES
  - DO NOT USE THE TELEPHONE OR ANY RADIO DEVICE
  - ISOLATE ELECTRIC AND GAS CONNECTIONS FROM THE AREA FROM OUTSIDE THE LOCATION IN WHICH THE LEAKAGE IS OCCURRING
- B. All communications are to be verbal. Use of electronic systems may trigger a spark.
- C. IMMEDIATELY vacate the building.
- D. Re-entry into building cannot be made without approval from the Emergency Coordinator.

### **MEDICAL PROCEDURES**

- E. First Aid Attendants are required to respond to any emergencies as announced by the P.A. system or the emergency notification system.
- F. Depending on the nature of any injury, an ambulance may be necessary. Have someone dial the emergency number while you are dealing with the first aid emergency. State the nature of the emergency, your exact location and what assistance you require.
- G. The nearest hospital should be informed of the emergency if hospital services will be required.
- H. If chemicals are involved, consult the Material Safety Data Sheets (MSDS) for additional first aid response or antidotes. Or call the local Poison Centre.
- I. If a critical injury is involved, the appropriate Ministry or Department of Labor MUST be notified immediately by telephone and a report filed within 48-hours or earlier if required by local legislation. This should be done by the Human Resources Department.

The Joint Health & Safety Committee must be notified of the critical injury.

Complete the first aid injury log book stating the injured employee's name, nature of injury, treatment rendered, date and time of incident.



**TECHNOLOGICAL PROCEDURES**

**STRUCTURAL FAILURE / BUILDING COLLAPSE / AIRPLANE CRASH/ EXTERNAL EXPLOSION**

- If there is no advance warning, take cover under tables, desks, or other such objects.
- Keep away from windows and overhead light fixtures.
- Notify the Emergency Coordinator of extent of injuries and call for medical assistance.
- As soon as possible, sound alarm and evacuate building. If Assembly area is unavailable (littered with debris), proceed to the Off-site Assembly area (maybe located to the facility next door).
- Dial the emergency number for emergency response personnel.
- DO NOT RE-ENTER the building.

**LOSS OF UTILITIES**

Occasionally, adverse conditions such as heavy rain, snow, severe storms or other circumstances may cause damage to the facility or to the utilities systems. These can range from power failure resulting in no light, back-up generator failure, faults in the heating/air conditioning system (too hot, too cold or too humid), ruptured gas line, insufficient or no water pressure, ruptured water mains and flooding.

- If facility is in complete darkness, STOP WORK and remain in your work station.
- The back-up generator, if installed, should come on-line within a few minutes.
- Notify the Emergency Coordinator and if possible, determine length of power failure from utility company.
- If conditions worsen (i.e. stay too cold or dark), conduct an orderly evacuation to the Off-site Assembly area. Supervisors should provide evacuation guidance with flashlights, where available.
- If extent of power failure is prolonged and can impact the welfare of the employees, consider allowing them to go home.



## 36. BUSINESS CONTINUITY PLAN

A Business Continuity Plan (BCP) aims to minimise the consequences (*operational, financial, brand, etc.*) of a disruptive major incident.

It is composed of a Business Recovery Plan and a Crisis Management Organization.

Here are the 4 major steps to implement a Business Continuity Plan:

### **STEP 1 – BUSINESS IMPACT ANALYSIS**

The Business Impact Analysis aims to map all activities and process and determine for each of them the Maximum Tolerable Downtime. The goal is to determine how long activities can be stopped without major impact (*financial, regulatory, brand, etc.*). Business Impact Analysis aims also to identify all necessary resources for activities to stay sustainable (*necessary Human resources, sites, IT systems, third parts*).

### **STEP 2 – BUSINESS RECOVERY STRATEGY**

The strategy aims to define what to do in case of major crisis impacting the Human resources, the sites, the IT systems or crucial third parts. There may be various solutions (*Use of alternative resources, manual workaround, outsourcing, etc.*).

Solution identified must fulfil requirements expressed in the Business Impact Analysis.

### **STEP 3 – CRISIS MANAGEMENT**

The crisis organization aims to manage a crisis as soon as it occurs. It must define immediate response and actions to be undertaken at the early step of a crisis. It is composed of people and process, trained to face a crisis situation. It is usually composed of a crisis Director (to take decisions), a crisis coordinator (*to make the link with all stakeholders*), a crisis communicator (*to manage internal and external communication*), a crisis secretary (*to trace all events and actions*).

### **STEP 4 – CRISIS EXERCISE**

A BCP cannot be considered sustainable until it has been proven workable through a crisis exercise. Exercises provide a large number of benefits; train the crisis organization, verify consistency of plans and completeness of documentation, build confidence in BCP.

BCP must be then updated at least once a year in order to stay sustainable. Define regular exercises (*once a year for instance*) might be the best solution to review frequently the entire plan before testing.



## 36.1 THE BUSINESS CONTINUITY PLAN TEAM

The EH&S Committee has to define the roles and responsibilities of the people taking part in the Business Continuity Plan in order to:

- Ensure the right individuals are in the right roles to maximize business continuity performance.
- Ensure that all business continuity planning participants understand what is expected of them.
- Helps to clearly identify any gaps in knowledge, skills, and abilities for individuals assigned to business continuity roles and responsibilities.



## SECTION 9 - GLOSSARY AND APPENDIX







## 37. GLOSSARY

Action Level	The concentration or exposure beyond which engineering or administrative controls must be implemented.
Acutely Hazardous	Any substance likely to cause severe adverse health effects from relatively small dosage.
ASTs (Aboveground storage tank system)	means one or more (commonly connected) aboveground storage tank(s), and including all underground and aboveground connections, piping, pumps, and dispensers.
Audiogram	An audiogram is a graphical analysis of hearing loss.
Audiometric Testing	A method to establish a hearing evaluation for individuals.
Authority having jurisdiction	means the government whether central, state or provincial or municipal officer(s) who has (have) the legal authority to regulate the underground storage tank systems.
Body (or Bodies) of water	means a creek, stream, river, estuary, canal, ocean, pond, lake, reservoir, or other accumulation of water or conductor of water, and includes a dry watercourse.
Cathodic protection or cathodically protected	means a method of preventing or reducing corrosion to a metal surface by making the metal a cathode by using either an impressed direct current or attaching sacrificial anodes.
Certified	means, when used in reference to a storage tank, component, or accessory, that the installation has been investigated by an approval/certification group and found to be in compliance with their requirements.
Combustible Liquid	A combustible liquid is defined as a liquid with a flashpoint at or above 100°F.
Containment	A barrier preventing passage of something undesirable.
Discharge	means releasing, spilling, leaking, pumping, pouring, emitting, emptying, or dumping of petroleum products or other chemicals into the environment, whether intentional or unintentional.
Dispenser sump	means a container, located underneath or near a dispenser or self-contained suction pump that collects or contains leaks.
Effluent	Any gas or liquid emerging from a pipe or similar outlet. Usually referring to waste products.



Environmental impacts (or receptors)	means any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products and services.
Flammable Liquid	A flammable liquid is defined as a liquid with a flashpoint below 100°F. In general terms, it is a liquid which will ignite easily and burn rapidly.
Flammable liquid	means any liquid having a closed cup flash point below 37.80C and a vapour pressure not exceeding 275.8 Kpa (absolute) at 37.80C.
Flash point	means the minimum temperature at which a liquid within a container gives off vapour in sufficient concentration to form an ignitable mixture with air near the surface of the liquid.
Handling	means the storing, transmitting, transporting, or distributing of petroleum products or other chemicals and includes putting petroleum products into the fuel tank of a motor vehicle, vessel, or aircraft, other motorized equipment or into a container.
Interstitial space	means the space between the two walls or barriers within a secondary containment system.
Leak	means any loss of products because of a defect in the storage tank system.
Leak detection	means a device or method that is capable of detecting leaks in storage tanks and piping.
Manifest	An itemized list which is used to track shipments between the generator, carrier and receiver.
Material Safety Data Sheet	Material safety data sheets contain written or printed material concerning a hazardous chemical as prescribed by law. They contain basic information needed to insure the safety and health of the user at all stages of its manufacture, storage, use, and disposal.
Piping	includes all pipes, fittings, and valves necessary for safe handling and storage of product in a storage tank system.
Refrigerant	Any substance which by undergoing a change of phase (solid to liquid or liquid to vapour) lowers the temperature of its environment.
Sound Pressure	Sound pressure is a measure of sound intensity levels as compared to the threshold of human hearing.



Storage tank	means a closed container that has a capacity of more than 250 L and is designed to be installed in a fixed location.
Toxic Material	The ability of a substance to cause damage to living tissue, impairment of the central nervous system, severe illness or, in extreme cases, death when ingested, inhaled, or absorbed by the skin.
USTs - Underground storage tank system	means one or more completely buried and/or partially buried (commonly connected) storage tank(s), and including all underground and aboveground connections, piping, pumps, and dispensers.
VOC	A volatile organic compound is a carbon-based compound which evaporates quickly.
Waste Class	There are ten categories that can be used to assign a waste to the hazardous classification. An appropriate waste class must be assigned to all hazardous waste.

