RISK ASSESSMENT&DISASTER MANAGEMENT PLAN

1.1 Risk Assessment and Hazard Management

Hazard analysis involves the identification and quantification of the various hazards (unsafe condition) that exist in the plant. On the other hand, risk analysis deals with the identification and quantification of the risk, the plant equipment and Personnel are exposed to, due to accidents resulting from the hazards present in the plant.

Risk analysis involves the identification and assessment of risks to the population exposed to hazards present. This requires an assessment of failure probability, credible accident scenario, vulnerability of population etc. Much of this information is difficult to get or generate consequently, the risk analysis in present case is confined to maximum credible accident studies and safety and risk aspect related to proposed expansion of Molasses based Distillery. Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

On-site

- Exposure to fugitive dust, noise, and other emissions
- Housekeeping practices requiring contact with solid and liquid wastes
- Emission/spillage etc. from storage &handling

Off-site

- Exposure to pollutants released from offsite/ storage/related activities.
- Contamination due to accidental releases or normal release in combination with natural hazard.
- Deposition of toxic pollutants in vegetation / other sinks and possible sudden releases due to accidental occurrences.

1.1.1 Risk Analysis Methodologies

Risk assessment often requires the synthesis of risk profiles, which represent the probability distribution of total annual loss due to a certain set of events or activities. These assessments usually involve estimation of losses for several sub-classifications of the overall process and synthesis of the results into an aggregate risk profile.

Main risk assessment technologies are:

- **Hazard and operability study (Hazop), and**
- **Fault Tree Analysis (FTA)**

Hazop Study

The HAZOP study is a systematic technique of identifying hazards of operability problems of a process and lists all possible deviations from normal operating condition and how they might occur. The consequences of the process are assessed and the means available to detect and correct the deviations are examined. Thus, within the entire process all "credible" deviations that could lead to hazardous events or operability problems are identified.

FTA is primarily a means of analyzing non-identifiable hazards. Hazards of top events (the ultimate happening that is to be avoided) are first identified by other techniques such as HAZOP. Then all combinations of individual failures that can lead to that hazardous event show the logical format of the fault tree. Estimating the individual probabilities and then using the appropriate arithmetical expressions can calculate the top event frequency.

1.2 Disaster Management Plan

1.2.1 Definition

A major emergency in a works is one, which has the potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption both inside and outside the works. It would normally require the assistance of emergency services to handle it effectively.

1.2.2 Scope

An important element of mitigation is emergency planning, i.e. identifying accident possibility, assessing the consequences of such accidents and deciding on the emergency procedures, both on site and off site that would need to be implemented in the event of an emergency.

Emergency planning is just one aspect of safety and cannot be considered in isolation from unit, fully endorses this fact and hence before starting to prepare the plan, works management will ensure that the necessary standards, appropriate to safety legislation, are in place.

1.2.3 Objective

The overall objectives of the emergency plan will be:

- To localize the emergency and, eliminate it; and
- To minimize the effects of the accident on people and property.
- Elimination will require prompt action by operations and works emergency staff using, for example, fire–fighting equipment, water sprays etc.
- Minimizing the effects may include rescue, first aid, evacuation, rehabilitation and giving information promptly to people living nearby the project site.

1.2.4 Identification of Hazards

The following types of hazards may be identified at proposed project:

- Fire in Electric Panels, Oil room and Diesel storage.
- Explosion in Boiler house etc
- Waste treatment processes.
- Cleaning of Equipments and Tanks, which have held chemical substances.

To deal the above emergencies, the Emergency Plan is prepared.
There are four major categories of catastrophic failure which exists in the boiler itself.

1. **Melt down**: This is a result of the heating surface metal reaching its melting point. It is a result of the boiler operating on very low water conditions. This by itself will not cause an explosion but will do major damage to the boiler and create a dangerous situation which could lead to an explosion.
2. **Thermal Shock:** This is a condition where low water causes the heating surfaces to become overheated and then cooler water is added. The water then flashes to steam which expands 1600 times its volume as water and causes the explosion because there is not enough room for the steam to expand.
3. **Combustion explosions:** These can be a result of gases which build up and an ignition source ignites the gases. This can happen inside the boiler or outside. There are safety devices in place to avoid this situation.
4. **Steam Pressure:** Excessive steam build up which exceeds the design pressures of the vessel. There are also safety device to prevent this.

The boiler operator should have a duty checklist listing routine duties. A duty checklist helps to ensure quality and consistency in performing various tasks.

The duty checklist is developed in conjunction with the boiler room log to ensure that critical duties such as safety valve testing are performed. When taking over a shift, any extraordinary concerns are communicated to the boiler operator starting the shift. This alerts the boiler operator of special procedures that may be required during the shift. Procedures commonly completed during a shift include water column and gauge glass blowdown, bottom blowdown, low water fuel cutoff testing, and flame scanner testing.

A boiler room log is used to record information regarding operation of the boiler during a given period of time. The number and frequency of the checks to be performed depend on the plant. Some plants maintain a log for every 8-hour period. Other plants maintain a log for a 24-hour period. Maintaining a boiler room log allows the operator to evaluate the past performance of the boiler. In addition, boiler room log information can be useful in determining the cause of a malfunction and/or predicting a possible problem.

Ensuring proper water level may be the most important duty of an operator. The gauge glass is the primary devise used in determining water level and must be maintained in proper condition. It is connected to the water column which levels out the turbulent water in the boiler so it can be accurately read. All steam boilers must have two methods of determining the water level in the boiler. The gauge glass is the first and easiest method for determining boiler water level. A second method for determining boiler water level is try cocks. Try cocks are valves located on the water column used to determine the boiler water level if the gauge glass is not functional.

1.3 Emergency Planning

1.3.1 General

Disaster Management Plan for an industrial unit is necessarily a combination of various actions which are to be taken in a very short time but in a present sequence to deal effectively and efficiently with any disaster, emergency or major accident with an aim to keep the loss of men, material, plant/machinery etc. to the minimum.

The main functions of the Disaster Management Cell are to prepare a detailed Disaster Management Plan, which includes:

- Identification of various types of expected disaster depending upon the type of the industrial unit.
- Identification of various groups, agencies, departments etc. necessary for dealing with a specific disaster effectively.

- Preparation – by intensive training of relevant teams/groups within the organization to deal with a specific disaster and keep them in readiness.
- Establishment of an early detection system for the disaster.
- Development of a reliable instant information/communication system.
- Organization and mobilization of all the concerned departments/ organizations / groups and agencies instantly when needed.
- A major disaster that can be expected in this proposed distillery be due to fire.

1.3.2 Emergency Planning for Disaster due to Fire

Cable rooms, transformer, unit, auxiliary transformers, oil tanks, etc. within the plant are the likely areas for which disaster management plan is to be made to deal with any eventuality of fire. Stores, workshop, canteen and administrative building will be included.

1.3.3 Classification of Fire

- Class (A)
  Fire involving combustible materials like wood, paper, cloth and bagasse etc.
- Class (B)
  Fire due to liquid materials like oil, diesel, petroleum products and all inflammables.
- Class (C)
  Fires involving domestic and industrial gases like butane and propane etc.
- Class (D)
  Metal fires etc.
- Class (E)
  Electrical fires due to short circuiting etc.

1.3.4 Need of Establishing a Fire Fighting Group

A small spark of fire may result into loss of machines and the damage by fire may high economic losses. This type of losses can be avoided by preventing and controlling the fire instantly for which fire–fighting group will be established.

Establish which would house and keep in readiness, the following types of equipment and arrangements.

- CO_2 extinguishers
- Dry powder chemical extinguishers
- Foam extinguishers
- 80 mm. spray hoses
- Fire brigade
- Fire hydrant
- Protocol (chemical to combat oil fires).

In order to avoid fire in cable galleries, all the power and control cables of FRLS type (fire resistant low smoke) will be used.

1.3.5 Inspection

- Fire alarm panel (electrical) will cover the entire plant. The inspection group will periodically inspect fire extinguishers in fire stations and machines and other places.
- The groups will display emergency telephone number boards at vital points.
- The group will regularly carry out general inspection for fire.

1.3.6 Procedure for Extinguishing Fire

The following steps will be taken during a fire accident in the system:

- As soon as the message is received about fire, one of the systems will be diverted to the place of the fire accident along with a staff member.
- Simultaneously plant fire station will be informed by phone walkie for fire brigades and fire stations of nearby area.
- In the meanwhile, the pipe system will be operated to obtain maximum pressure on output. In case cables are within the reach of fire, power supply will be tripped and the cables shifted.

1.3.7 Fire Fighting with Water

Adequate and reliable arrangement is required for fighting the fire with water such as:

1. Provision for Fire brigade and Fire hydrant.
2. Arrangement of pipelines along and around all vulnerable areas.
3. Provision of valves at appropriate points to enable supply of water at the required place/area or divert the same to another direction/pipe line.
4. Provision of overhead tanks which will be providing with the water during power failure and it would work by the gravitational force.

1.3.8 Sources of Water for Fire Fighting

The following two sources of water have been considered for firefighting:

- Overhead Tank
- Raw Water Reservoir

1.3.9 Fire Fighting with Fire Extinguishers

To deal with fire – other than carbonaceous fires, which can be deal with by water – suitable fire extinguishers are required to do the job effectively. It is therefore, necessary to keep adequate number of extinguishers in readiness at easily approachable places. Adequate number of fire stations would be installed. Further, other spray groups from the system will be diverted to the spot.

In case of fire in the belt, belt will be cut near the burning portion to save the remaining parts. After extinguishing the fire, the area will be well prepared for reuse.

1.4 On–Site Emergency Plan

The views of the possible hazards that can arise out of the daily operations in the distillery plant, various measures are adopted to prevent the occurrence of a major accident. This comprises of:

- Built in safety measures, alarms, trips and interlocks etc.
- Standard safe operating and maintenance procedures permit system etc.
- Training of all the involved staff in normal and emergency operating procedures.
- Training of all employees in safety, fire fighting and first aid.

However, in spite of these precautions, it is required to foresee situation of major accident and plan for taking timely action to minimize the effects of such incident on the safety and health of persons working in the plant as well as those living around the premises.

1.4.1Preparation of Plan

1.4.2 Alarm System

A siren shall be provided under the control of Security office in the plant premises to give warning. In case of emergencies this will be used on the instructions to shift in charge that is positioned round the clock. The warning signal for emergency shall be as follows:

- *Emergency Siren: Waxing and waning sound for 3 minutes.*
- *All clear signal: Continuous siren for one minute.*

1.4.3 Communication

Walkies & Talkies are located at strategic locations; internal telephone system EPBX with external P&T telephones would be provided.

1.4.4 Fire Protection System

1.4.4.1 Fire Fighting System

The fire protection system for the unit is to provide for early detection, alarm, containment and suppression of fires. The fire detection and protection system has been planned to meet the above objective an all–statutory and insurance requirement of Tariff Advisory Committee (TAC) of India. The complete fire protection system will comprise of the following:

(a) Fire brigade

Automatic / manual fire detection & alarm system

(b) Fire Hydrant

Fire hydrant will be provided at all around in the plant as per TAC Norms.

(c) Portable fire extinguishers

Various areas of the plant will have one or more of the above system depending upon the particular nature of risk involved in that area.

(d) Portable Chemical Fire Extinguishers

These are intended as a first line of defense, and hence will be stationed at strategic locations in different buildings and also for outdoor facilities. Portable fire extinguishers will be foam type; carbon dioxide type and multipurpose dry chemical (**MPDC**) type.

(e) Fire Detection and Alarm System

Fire detection and alarm system an effective means of detection, visual indication of fire location and audible alarm of any fire at its incipient stage. This system will comprise fire alarm panels, automatic fire detectors, manual call points and fire siren (hooter).

The main fire alarm panel will provide both visual and audible alarm of fire in any protected areas of the plant.

Manual break glass type fire alarms will be provided at strategic locations where high hazards exits.

Automatic fire detectors will be provided for coal handling areas and in plant areas such as control rooms, switchgear rooms, cable galleries etc.

1.4.5 First Aid

A first aid centre with adequate facilities shall be provided. It shall be maintained round the clock by a compounder cum dresser and a doctor. An Ambulance shall also be provided at site to carry affected people to hospital.

1.4.6 Security

The security requirements of the company premises shall be taken care of by CSO assisted by a Fire In charge. The team, apart from the normal security functions will manage the role required during a disaster management operation as a part of the crisis control team.

1.4.7 Safety

The safety wing led by a Safety Manager will meet the requirement of emergencies round the clock. The required safety appliances shall be distributed at different locations of the plant to meet any eventualities. Poster/placards reflecting safety awareness will be placed at different locations in the plant area.

1.4.8 Evacuation Procedure

As the major hazard is only due to fire, which has more or less localized impact no mass evacuation, procedures are required. Evacuation would involve only the people working very close to the fire area.

1.4.9 Emergency Control Center

Provision is made to establish an Emergency Control Centre (ECC) from which emergency operations are directed and coordinated. This center is activated as soon as on–site emergency is declared.

The ECC consists of one room, located in an area that offers minimal risk being directly exposed to possible accidents.

During an emergency, the Emergency Management Staff, including the site controller will gather in the ECC. Therefore, the ECC is equipped with adequate communication systems in the form of telephones and other equipment to allow unhampered organizations and other nearby facility personnel.

The ECC provides shelter to its occupants against the most common accidents; in addition, the ECC's communication systems are protected from possible shutdown. The ECC has its own emergency lighting arrangement and electric communication systems operation.

Only a limited and prearranged number of people are admitted to the ECC, when in use. This eliminates unnecessary interference and reduces confusion.
The ECC is always ready for operation and provided with the equipment and supplies necessary during the emergency such as:

- Updated copies of the On–site Disaster Management Plan.
- Emergency telephone numbers.
    - The names, phone number, and address of external agencies, response organizations and neighboring facilities.
- The adequate number of telephone (more than two).
- Emergency lights.
- List of fire extinguishers with their type no. and location, capacity, etc.
- Personal protective equipment.

Safety helmets – List of quantity & location.

- Clock.
- Status boards/message board.
- Material safety data sheets for chemicals handled at the facility.
- Several maps of the facility including drainage system for surrounding area showing:
- Areas where hazardous materials are stored.
- Plot plans of storage tanks, routes of pipelines, all water permanent lines etc.
- The locations where personal protective equipment are stored.
- The position of pumping stations and other water sources.
- Roads and plant entrances.
- Assembly areas.
- Lay out of Hydrant lines.

1.4.10 Communication Equipment and Alarm Systems

This kind of equipment is absolutely vital for notifying accident; make the emergency known both inside and outside of the facility, and coordinating, the response actions among the various groups involved in response operations.
In particular, this equipment is used to communicate within the facility; communicate between the facility and outside organizations; and inform the public.
Different communications systems can vary in effectiveness, depending on the task. The most common types installed in the plant are given below.

1.4.10.1 Sirens

These are audible alarm systems commonly used in facilities. In case of any emergency siren will be operated short intermittently for 1.5 minutes.

An alarm does more than just emergency warning. It also instructs people to carry out specific assignments, such as reach to assembly point for further instructions and actions, or carry out protective measures; this can be achieved only if the people are familiar with the alarm systems and are trained to respond to it.

1.4.11 Personal Protective Equipment

This equipment is used mainly for three reasons; to protect personnel from a hazard while performing rescue/accident control operations, to do maintenance and repair work under hazardous conditions, and for escape purposes. The list of Personal Protective Equipment provided at the facility and their locations are available in ECC.

Effective command and control accomplish these functions necessitates personal trained in this On–site Disaster Management Plan with adequate facilities and equipment and equipment to carry out their duties and functions.

1.5 Off- Site Emergency Preparedness Plan

The task of preparing the off- site emergency plan lies with the district collector, However the off site plan will be prepared with the help of the local district authorities. The proposed plan will be based on the following guidelines.

Plan of Co–Ordination

(A) Liaison with

1. External Authority:

- Sub Divisional Officer (SDO)
- Principal Medical Officer (PMO).
- Dy. SP.
- Fire Officer.
- Local Panchayat Officials.
- B.D.O.
- External Agencies
- Press.
- Fire Station.
- Police.
- Medical.

- Voluntary Organisation.
- Railway.
- Roadways
- Private Bus Services

(B) Making plan in advance (By Management and External Authorities/Agencies.Govt. Hospital.

(C) Roll and Statutory duties of outside agencies.

- Traffic Centre.
- Assisting the Medical and Evacuation team.
- Preventing un-authorized entry of personnel into the affected areas.

Control on lookers.

(D) Duties of Public Relation officer (PRO)

- To keep liaison with Govt.
- To publish/release news in the new papers.

(E) S.D.O.

- To restore law & order.
- To help in getting aid from other Administrative Authorities.

(F) Duties of Medical Officer

- A full time Medical officer and he will discharge duties during any emergency.

He shall:

- Send the adequate medical staff to the emergency operation center for ensuring immediate medical attention.
- Organise for transporting the injured to the hospitals wherein arrangements are made to handle such emergencies. The nearby hospitals should be identified in advance.
- Inform all the nearby hospitals of the situation and appraise them of the antidotes that would be necessary for treatment, if any.
- Make arrangements for requisitioning for extra ambulances for movement of the injured to Hospital.
- Ensure that records of blood group of all employees are easily accessible and enough blood of the specific group is available for casualties.

(G) Duties of B.D.O. (Block Development Officer)
• To control the spread of rumours.

(H) Declaring the Major Emergency
• By putting notice on notice Board.
• By publication in the News Papers.
• Announcement by P.A. System in nearby villages.

1.5.1 Procedure for Testing & Updating the Plan

Simulated emergency preparedness exercises and mock fire fighting exercises including mutual aid scheme resources and in conservation with district emergency authority to be carried out time to time.

1.5.2 Disclosure of Information to Worker & Public Awareness System in Existence or Anticipated

- Safety awareness among workers by conserving various training programmes and Seminars, competition, slogans etc.
- Practical exercise.
- Distribution and practices of safety Instructions. Safety Quiz contests.
- Display of Safety Posters & Safety Slogans.
- Developing Safety Instructions for every Job and ensuring these instructions/booklets or manuals by the workers.

1.5.3 Risk Assessment & Damage Control

Risk assessment is the determination of quantitative or qualitative value of risk related to a concrete situation and a recognized threat.
Activities requiring assessment of risk due to occurrence of most probable instances of hazard and accident are both onsite and off-site.

1.5.4 Risk Assessment for the Project

The Distillery plant based on Molasses is labor intensive and uses large scale and potentially hazardous manufacturing processes. The industry experiences accident rates that are average compared with some other manufacturing industries. Molasses based distillery industries experiences risk of a number of hazards inherent to the Alcohol production process. Some examples of such hazards are:
Exposure to Hazardous Material;
• Physical Hazards,
• Exposure to Heat from Boilers

• Exposure to Chemical Stored

These mainly impact on those working within the industry, although health hazards cannot as such impact on local communities.

1.5.5 Exposure to High Temperature

Recommended prevention and control techniques include the following:

• Shielding surfaces where workers proximity and close contact with hot equipment is expected,

• Using personal protective equipment (PPE), as needed (e.g. insulated gloves and shoes);

• Minimizing the work time required in high temperature environments by implementing shorter shifts at these locations.

• Proper Number Fire Extinguisher would install.

1.5.6 Physical Hazards

Injuries during Project operation are typically related to slips, trips, and fall; contact with falling / moving objects; Other injuries may occur due to contact with, or capture in operating machineryActivities related to maintenance of equipment, including Boilers, Power Supply system, RO plant and belt conveyors, represent a significant source of exposure to physical hazards. Such hazards may include the following:

• Falling / impact with objects

• Hot surface burns

• Transportation

• Contact with allergic substances.

Following management measures will be implemented to prevent the physical hazards in the plant:

• Any person working on equipment with moving parts will personally ensure the equipment is de-energized, isolated and locked/tagged out.

• Any person working from a position with the potential risk for a fall from height will use fall protection.

• Any person doing flame welding, cutting or brazing in the proximity of any flammable material will obtain PPE.

• Prescribed PPE will be provided to all workers exposed to open processes or systems.

• Increase of any accident immediate & proper medical care shall be taken.

Table: - 1.1 Measures To Prevent The Physical Hazards In The Plant:

High risk categories	Prevention
Contractors	Contractor safety management
Young / temporary employees	Special safety induction
Direct cause	
Traffic and mobile plant	Driving training
Fall from height, object falling from heights	Safety procedure for work at heights, over head protection
Caught in starting / moving equipment	Plant isolation procedures

1.6 Occupational Health and Safety

Large industries, multifarious activities are involved during construction, erection, testing, commissioning, operation & maintenance, the men, materials and machines are the basic inputs. Along with the boons, the industrializations generally bring several problems one of them is occupational health and safety.

The industrial planner, therefore, has to properly plan and take the steps to minimize the impacts of industrialization and to ensure appropriate occupational health, safety including fire plans. All these activities again may be classified under construction & erection, and operation & maintenance. The proposed safety plan is given below:

1.6.1 Occupational Health

Occupational health needs attention both during construction & erection and operation & maintenance phases. However, the problem varies both in magnitude and variety in the above phases.

1.6.2 Construction & Erection

The Occupational health problems envisaged at this stage can mainly be due to constructional accident and noise.

To overcome these hazards, in addition to arrangements to reduce it within TLV's personnel protective equipments shall also need to be supplied to workers.

1.6.3 Operation and Maintenance

The problem of occupational health, in the operation and maintenance phase is hearing loss due to noise. Suitable personnel protective equipments should be given to employees.

The working personnel be given the following appropriate personnel protective equipments.

- Industrial Safety Helmet.
- Crash Helmets.
- Face shield with replacement acrylic vision.
- Zero power plain goggles with cut type filters on both ends.
- Zero power goggles with cut type filters on both sides and blue colour glasses.
- Welder's equipment for eye & face protection.
- Cylindrical type earplug.
- Earmuffs.
- Self contained breathing apparatus.
- Leather apron.
- Aluminised fiberglass fix proximity suit with hood and gloves.
- Boiler suit.
- Safety belt/line man's safety belt.
- Leather hand gloves.
- Canvas cum leather hand gloves with leather palm.
- Electrical safety shoes without steel tie.
- Gum Boots.

1.7Safety and Emergency Plan

Safety of both men and materials during construction and operation phases is of concern. The preparedness of an industry for the occurrence of possible disasters is known as emergency plan, which described as Disaster Management Plan (DMP) above. Safety requirement during construction, operation and maintenance phases the safety policy with the following regulations may be observed.

- To allocate sufficient resources to maintain safe and healthy conditions of work.
- To take steps to ensure that all known safety factors are taken into account in the design, construction, operation and maintenance of plants, machinery and equipment.

To ensure that adequate safety instructions are given to all employees.

- To provide wherever necessary protective equipment, safety appliances and clothing, and to ensure their proper use.
- To inform employees about materials, equipments or processes used in their work, which are known to be potentially hazardous to health or safety.
- To keep all operations and methods of work under regular review for making necessary changes from the point of view of safety in the light of experience and aptitude knowledge.
- To provide appropriate facilities for first aid and prompt treatment of injuries and illness at work.
- To provide appropriate instruction, training, retraining and supervision to employees in health & safety, first aid and to ensure that adequate publicity is given to these matters.
- To ensure proper implementation of fire prevention methods and an appropriate fire fighting service together with training facilities for personnel involved in this service.
- To ensure that professional advice is made available wherever potentially hazardous situations exist or might arise.
- To organize collection, analysis and presentation of data on accident, sickness and incident involving personal injury or injury to health with a view to taking corrective, remedial and preventive action.
- To organize collection, analysis and preventive action.
- To promote through the established machinery, joint consultation in health and safety matters to ensure effective participation by all employees.
- To publish/notify regulations, instructions and notices in the common language of employees.
- To prepare separate safety rules for each types of occupation/processes involved in a project.
- To ensure regular safety inspection by a competent person at suitable intervals of all buildings, equipments, work places and operations.
- In operation, the safety guidelines have to be framed in consultation with manufacturers and be implemented.

1.8.1 Safety Organization

Construction & Erection Phase

A Qualified and Experienced safety officer has to be posted. The responsibilities of the safety Officers include identification of the hazardous condition and unsafe acts of workers and advise on corrective ac action, organize training programmes and provide professional expert advice on various issues related to occupational safety and health. He is also responsible to ensure compliance of Safety Rules/Statutory provision.

1.8.2 Operation & Maintenance Phase

When the construction is complete the posting of safety officers shall be in accordance with the requirement of Factories Act and their duties and responsibilities shall be as defined thereof.

1.8.3 Safety Circle

In order to fully develop the capabilities in identification of hazardous processes and improving safety and health, safety Circle would be constituted in each area of work. The circle would consist of 5-6 employees from that area. The circle normally shall meet for about an hour every week.

7.8.4 Health and Safety Monitoring Plan

All the potential occupational hazardous workplace such as chlorine storage area, acid and alkali storage areas will be monitored regularly. The health of employees working in these areas will be monitored once in a year for early detection of any ailment due to exposure to hazardous chemicals