Risk Assessment

1.1 PUBLIC CONSULTATION

The details will be incorporated after public consultation is completed by Karnataka State Pollution Control Board.

1.2 DISASTER MANAGEMENT & EMERGENCY PREPAREDNESS PLAN

The maximum Rectified Spirit (RS)/Extra Neutral Alcohol (ENA)/Ethanol production in the plant will be 60 KLPD. As per the Manufacture, storage and import of Hazardous Chemical rules, 1989, the flammable chemicals are categorised into the following three categories

Class I A : Liquids having flash point below 73°F and boiling point below 100°F
Class I B : Liquids having flash point at or above 140 °F and below 200 °F
Class I C : Liquids having flash point at or above 73 °F and below 100 °F

Rectified spirit and ENA/ Ethanol based on the above classification and properties fall under Class I B flammable liquid.

To ensure safe operation of the plant, DSSSSL has proposed to carry out the Risk Assessment study with the following objectives.

1.2.1 PRELIMINARY HAZARD ANALYSIS

Preliminary Hazard analysis is used to identify typical and often relatively apparent risk sources and damage events in a system. Based on the preliminary hazard identification, the storage and handling facilities of RS and ENA has been recognized as distinctive and relatively evidential risk source.

Hazards of significant nature, whose consequence potential is of worth consideration, and wherein a specified area, or where more number of personnel likely to be present etc., are considered in identifying the hazards. Considering the DSSSSL plant, the significant hazards could be hazards related to storage and handling of Rectified Spirit and ENA.

1.2.2 PRELIMINARY HAZARD ANALYSIS - STORAGE

Loading and unloading from storage and forwarding of RS and ENA may lead to containment failure for various reasons. Such situation can cause fires or explosions depending upon the situation.

1.2.3 INVENTORY HAZARD ANALYSIS

Inventory analysis involves the assessing of RS and ENA in detail with reference to the characteristic. RS and ENA properties are similar in properties except for ethanol content. Hazards considered below for RS also applies to ENA.

RS is a clear colourless liquid with strong odour and bitter taste. RS is on the Hazardous substance list because it is regulated by OSHA and cited by ACGIH, DOT, NFPA and NIOSH.

It has an explosion limit of 3.3% to 19% by volume in ambient air. It has an ignition temperature of 363 Deg.C and flash point of more than 13 deg.C and boiling point of 78 Deg.C. In view of these properties, it is highly flammable.

The vapor is heavier than air and may ignite at distant ignition sources. Ethyl alcohol must be stored to avoid contact with oxidizers. The product is stored in tightly closed contained in a cool, well-ventilated area away from heat or flame.

Health Hazards

The following acute health effects may occur

- Can affect when breathed in and by passing through skin
- May cause mutations
- Can irritate the skin , repeated contact can dry the skin with cracking, peeling and itching
- Exposure can cause headache, nausea, a feeling of heat and drowsiness. Higher exposure can cause unconsciousness
- Exposure can irritate the eyes, nose, mouth and throat
- Breathing of RS can irritate the lungs causing coughing and/or shortness of breath.

WORKPLACE EXPOSURE LIMITS

	OSHA	**NIOSH**	**ACGIH**
8 – hour exposure	1000 ppm	1000 ppm	1000 ppm

Extra Neutral Alcohol

ENA is similar to Rectified Spirit in properties and hazards.

FIRE DUE TO SPONTANEOUS COMBUSTION OF COAL DUST

Coal dust when dispersed in air and ignited would explode. Crusher Houses and conveyor systems are most susceptible to this hazard. To be explosive, the dust mixture should have:

- Particles dispersed in the air with minimum size
- Dust concentrations must be reasonably uniform
- Minimum explosive concentration for coal dust (33% volatile) is 50 grams/m^3.

Failure of dust extraction and suppression systems may lead to abnormal conditions and increasing the concentration of coal dust to

the explosive limits. Sources of ignition present are incandescent bulbs with the glasses of bulkhead fittings missing, electric equipment and cables, friction, spontaneous combustion in accumulated dust.

Dust explosions may occur without any warnings with maximum explosion pressure upto 6.4 bars. Another dangerous characteristic of dust explosions is that it sets off secondary explosions after the occurrence of the initial dust explosion. Many a time, the secondary explosions are more damaging than primary ones.

The dust explosions are powerful enough to destroy structures, kill or injure people and set dangerous fires likely to damage a large portion of the Coal Handling Plant including collapse of its steel structure, which may cripple the lifeline of the power plant

Stockpile areas will be provided with automatic garden type sprinklers for dust suppression.

1.2.4 MAXIMUM CREDIBLE ACCIDENT ANALYSIS

Maximum Credible Accident Analysis (MCA Analysis) is one of the methodologies evolved to identify worst credible accident with maximum damage distance which is still believed to be probable. The analysis does not include quantification of probability. The following is an attempt in that direction.

Hazardous substance may be released as a result of failures or catastrophes, causing damage to the surrounding area. The physical effects resulting from the release of hazardous substances can be calculated by means of models. The results thus obtained through modelling are used to translate the physical effects in terms of injuries and damage to exposed population and environment.

The probable fire hazard in the Plant is in the area of RS storage and handling. It is proposed to store about 40 days production of both the products within a common dyke of 40 X 55 m (total area 2600 Sqm). As a worst case it is assumed that the entire contents are leaked out. In the event of spilling its contents through a small leakage or due to rupture of the pipeline connecting the tank and on ignition fire will eventuately forming pool fire. In order to assess the radiation levels, Heat Radiation model has been used. The algorithm of the models is based on the formulae published in the yellow book by the TNO, Netherlands. Details of the model are given below:

1.2.5 HEAT RADIATION MODEL – POOL FIRE

The heat load on objects outside the burning pool of liquid can be calculated with the heat radiation model. This model uses an average radiation intensity which is dependent on the liquid. Account of the diameter to height ratio of the fire is also taken, which depends on the burning liquid. In addition, the heat load also gets influenced by the following factors:

1. Distance from the fire
2. The relative humidity of the air (water vapour has a relatively high heat absorbing capacity)

1.2.6 VISUALISATION AND SIMULATION OF MAXIMUM ACCIDENTAL SCENARIOS

The worst case scenarios which are considered for MCA analysis is Pool fire due to failure of storage of RS and ENA storage tanks in the farm area.

DSSSSL will provide 40 days storage of the final product within the plant premises. The following table provides the storage details of ENA and Rectified spirit

STORAGE DETAILS

Product	Storage Capacity	Nos.
Extra Neutral Alcohol	500 Kl	4
Rectified Spirit – grade - I	150 Kl	2
Other Distillated Spirit	50 Kl	2

As a worst case it is assumed that the entire contents are leaked out. In the event of spilling its contents through a small leakage or due to rupture of the pipeline connecting the tank and on ignition fire will eventuate forming pool fire. As the tanks are provided within the dyke the fire will be confined within the dyke wall.

Fires affect surroundings primarily through radiated heat which is emitted. If the level of heat radiation is sufficiently high, other objects which are inflammable can be ignited. In addition, any living organism may be burned by heat radiation. The damage caused by heat radiation can be calculated from the dose of radiation received, a measure of dose is the energy per unit area of surface exposed to radiation over the duration of exposure.

EFFECTS OF POOL FIRE

Pool fire may result when bulk storage tanks will leak/burst, and the material released is ignited. As these tanks are provided with dyke walls to contain the leak and avoid spreading of flammable material, the pool fire will be confined to the dyke area only. However, the effects of radiation may be felt to larger area depending upon the size of the pool and quantity of material involved.

Thermal radiation due to pool fire may cause various degrees of burns on human bodies. Moreover, their effects on objects like piping, equipment are severe depending upon the intensity. The heat radiation intensities due to the pool fire of the above tank farms are computed using the pool fire model. The results obtained are presented in the following Table.

POOL FIRE SCENARIOS AND RADIATION DISTANCES

Details	**RS / ENA Storage Tanks Farm**
Quantity of Storage, KL	**2400**
Dyke area(mXm)	**40 X 33 m**
Damage Distance (m)	
100 % Lethality (35.5 kW/m^2)	7
50 % lethality (25.0 kW /m^2)	34
1 %Lethality (12.5 kW /m^2)	86
First Degree burns (4.5 kW /m^2)	184
Normal Intensity with no discomfort (1.6 kW /m^2)	224

1.3 DAMAGE CRITERIA FOR HEAT RADIATION

The following table indicates likely damage level for different levels of heat radiations:

Damage Criteria for Heat Radiation

Incident Radiation Intensity (kW/m^2)	Type of Damage
62.0	Spontaneous ignition of wood.
	Sufficient to cause damage to process equipment.
25	Minimum energy required to ignite wood at infinitely long exposure (non-piloted)
12.5	Minimum energy required for piloted ignition of wood, melting plastic tubing etc.
4.5	Sufficient to cause pain to personnel if unable to reach cover within 20 seconds; however blistering of skin (1st degree burns) is likely.
1.6	Will cause no discomfort to long exposure.
0.7	Equivalent to solar radiation

1.3.1 CRITICAL RADIATIONS OF INTEREST ON HUMAN BODY

1. Un protected skin continuous 1.5 kW/m^2.
2. Blisters in skin at 30 sec 5 kW/m^2.
3. Protected skin 5 kW/m^2.
4. Special Protection 8 kW/m^2.

For continuous presence of persons, thermal radiation intensity levels of 4.5 kw/m^2 for plant operators and 1.6 kw/m^2 for outside population are usually assumed. These criteria are followed where peak load conditions may occur for a short time but mostly without warning. If the operators are properly trained and clothed, they are expected to run to shelter very quickly. For the secondary fires, a thermal incident radiation of 12.5 kW/m^2 is adopted as minimum criteria.

1.3.2 PHYSIOLOGICAL EFFECT OF THRESHOLD THERMAL DOSES

The effects of heat radiation depend upon the intensity and duration of exposure. Intensity and duration put together is the thermal dose. The consequences on human body for different thermal doses are tabulated here:

Dose Threshold (kW/m^2)	Effects
37.5	3rd degree burns
25.0	2nd degree burns
4.5	1st degree burns

1.4 CONSEQUENCE ANALYSIS

1.4.1 SITE SPECIFIC CONSEQUENCES

In order to assess the site specific consequences, information pertaining to the site such as nearest habitation, nearest industry etc was collected.

The nearest village to the plant site is Hirebevanur Village – 1.8 km – Southeast. Site specific consequence analysis of failure cases are carried out with the objective to study how many persons are involved in an accident and are likely to get killed or injured, or how large is the area which is likely to be destroyed or rendered unusable so that a true assessment of the safety of the plant can be made.

1.4.2 CONSEQUENCES OF HEAT RADIATION – RS/ENA/ETHANOL STORAGE TANKS FAILURE

Failure of RS storage tanks showed 100 %, 50 % and 1 % lethality upto a distance of less than 65 m due to radiation intensity of 37.5 kW/m^2, 25.5 kW/m^2 and 12.5 kW/m^2. Radiation of this intensity will cause damage to process equipment.

Radiation intensity of 4.5 kW/m^2 which cause first degree burns when exposed for 20 seconds will extend to a maximum distance of 140 m from the edge of the pool. Nearest Habitation is located at a distance of 2.5 km from the plant site. Therefore the pool fire scenario of storage tank farm does not call for offsite damage. However the major effect will be on the onsite DSSSSL personnel. The employees located with the 4.5 kW/m^2 contour will get affected.

FIRE FIGHTING FACILITIES

PROVISION OF FOAM SYSTEM FOR FIRE FIGHTING TO CONTROL FIRE FROM THE ALCOHOL STORAGE TANK

Compressed Air Foam Fire Extinguishing System will be provided for alcohol storage tanks which comprises Water Source, Fire Pump, Air Foam Concentrate, Proportioner, Foam Maker, Foam Discharge Outlet Control Panel, Pipe, Electric Wire, etc., The system will have Air Foam Chamber, Air Foam Nozzle, Air Foam Spray Head, Subsurface Foam Injection Air Foam-Water Monitor Nozzle and High Expansion Foam

Generators. Air Foam Concentrate is made into a fixed ratio of Air Foam Solution by mixing with water flowing through Feed Pipe and is mechanically stirred by Foam Maker which sucks air and generates great deal of Air Foam to extinguish a fire.

1.5 EMERGENCY PREPAREDNESS PLAN

As per the rules 10 to 13 under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 of Environment (Protection) Act, 1986, the occupier of the industry using hazardous chemicals in its manufacturing activity should develop an Emergency Management Plan. This includes description of the emergencies likely to arise out of the activity together with proposed measures to overcome the situation.

The purpose of the Emergency Preparedness Plan is to minimize the danger to life and property in the event of a plant emergency. To achieve this goal, well-defined, clear-cut steps are to be taken. For the purpose of this Plan, emergency procedures will be implemented for fires and explosions, material spills or natural disasters which require immediate emergency action and/or evacuation of the plant.

An onsite emergency in the industries involving hazardous processes or in hazardous installations is one situation which has potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption in the work area and usually, the effects are confined to factory or in several departments of factory, premises.

A quick and effective response at during an emergency can have tremendous significance on whether the situation is controlled with little loss or it turns into a major emergency. Therefore, the purpose of this Onsite Emergency Plan (OSEP) is to provide basic guidance to the personnel for effectively combating such situations to minimize loss of life, damage to property and loss of property. Therefore it is necessary

to have a clear picture of what is to be done when an emergency arises.

1.5.1 STRUCTURE OF EMERGENCY MANAGEMENT

Handling of emergency will be per the following four step process. The steps include

1. Noticing the accident
2. Informing the declarer
3. Declaration of Emergency
4. Interaction with the outside agencies

Noticing the Accidents

Emergencies are most probably noticed by the workers in the working zone though an emergency is to be controlled by a senior person. Therefore, the first person who comes to know that the emergency situation has risen would be the shift in charge working in the shift. This shift in charge on assessing the situation will get in touch with the declarer of emergency. Depending on the nature of the accident, the shift in charge may initiate the action for shutting down the plant. In case of minor accident shift in charge can continue with operations.

Informing declarer of emergency

Shift in charge will be responsible to inform the declarer of emergency through phone/messenger/siren for immediate attention at work spot for taking the management of emergency during the period. The declarer of Emergency as well as his alternate will be known to every one including the shift-in-charge. In case the main declarer of emergency is not available, the alternate has to be got in touch with.

Declaration of Emergency

The declarer of emergency at accident spot will assess the situation. If he finds that the accident could result in an onsite or off site emergency situation, he will immediately declare the emergency by a coded siren to inform the workers of the plant that an emergency situation has arisen and they would have to shut down the plant and move towards safer areas which have been predecided.

In case the emergency is of onsite nature, the management of the emergency will be entirely in the hands of 'Declarer'. On the other hand, if the situation is so serious that it effects are likely to be felt outside the plant premises, it would be 'offsite' emergency situation and the declarer has to get in touch with the pre-decided authority who will come and take over the management of emergency situation. The management of the emergency will be conducted from a control room or its alternate, both of which will have to be pre-decided.

Functions of Declarer

The declarer will have to perform number of functions simultaneously. Firstly, the declarer has to final out the nature of accident and has to get in touch with the incident controller. Incident controller will have two teams under for each shift under him. Incident controller will come to the accident spot along with the trained two teams. These two teams under the supervision of incident controller will start functioning. One team will look for injured workers inside the plant and help those who are not injured to be located and shifted to a safer spot. This team will also have to bring out injured workers to a safer spot from where arrangements have to be made for them to be taken to the hospital. The second team will go into the plant and try to control the cause of emergency. These two teams will have all the protective equipment available in the control room for such an emergency situation.

Interaction with Outside Agencies:

The controller of Emergency (incident controlled) will also get in touch with other industries and nearby population. The question of nearby population arises only if emergency is an 'Offsite 'one and the actual contact with the public will be done through the police department. The declarer of Emergency will have detailed information about the hospital, ambulances and antidotes which will be made available in the control room. The arrangement to carry the injured to the hospital also will have to be decided beforehand.

The declarer of emergency will inform the police personnel about the possible hazards beforehand so that they would be ready to undertake the work. Further, the declarer of emergency will inform the Fire Brigade is necessary and give all information to the local authorities. Chief Inspector of Factories and Police control room. He will also request Police Department to make statement to the Press and give information to the public. This job will be performed by only one person who will be entrusted this work and nobody else would be authorised to make any statement regarding the state of emergency.

Finally when the emergency has been brought under control by the Incident Controller, the declarer of emergency will give an "All Clear Signal"", the code of which will be decided beforehand. Thus the workers and the public would come to know that the emergency situation has come now under control.

1.5.2 DECLARER OF EMERGENCY

Communication with Declarer of Emergency

When an emergency situation arises in the plant, it will be generally noticed by worker on/near the accident spot. He will immediately get in touch with the shift-in-charge of the section. The shift-in-charge will initiate action to overcome the emergency, and will use his judgment to shut down the factory if he feels that emergency situation

is very serious. He will simultaneously get in touch with the Declarer of Emergency. The possible Declarers of Emergency in the order of priority are given below: -

(i) Plant Manager
(ii) Operations Manager
(iii) Maintenance Manager
(iv) Safety Manager

Communication with declarer

The shift-in-charge will try to get in touch with number one of Declarer of Emergency on phone or through. In case the first Declarer is not available or is out of station, as the case may be, due to some reason or the other, the shift-in-charge or the messenger, will get in touch with the second or the subsequent Declarer of Emergency in the order of priority.

Declaration of Emergency

The Declarer of Emergency will immediately come to the place of work, assess the situation and act in the appropriate way. He may decide that emergency may be declared in one or a few sections. On the other hand, he may feel that the emergency is more serious and the whole plant is to be shutdown, in which case he will take action towards shutting down of the whole plant. To indicate to the workers and other living in the vicinity that an emergency has arisen in the factory, he will give pre-decided intermittent siren.

In the case of internal emergency, the effects of which are not going to be felt outside the factory premises, he may try to control it himself. However, if the emergency is of “Off-site” nature, then he will get in touch with the Police who will come and take over the complete control of emergency and will act as “Declarer of Emergency” from

then onwards. In the meantime, the local Declarer of Emergency will continue as "Regular Declarer of Emergency".

1.5.3 CONTROL ROOM

The emergency has to be controlled from one particular spot. This spot should be away from the likely points of accident, will be easily accessible to Police and also there will be easy access from the plant to the Control Room.

The facilities that will be provided at both the Control Rooms are given below:

i) Plant layout plan
ii) Emergency telephone numbers
iii) General telephone numbers
iv) Emergency lighting
v) Daily number of people working in hazardous area
vi) Population around the Plant
vii) Hot lines to District Magistrate, Police control room, Fire brigade, Hospitals, antidotes and telephone number of hospitals, etc.
viii) Safety equipment

Apart from the above information, the Control Rooms will also have the list of possible accidents and the number of people to be affected in each possible accident displayed on daily basis depending on the wind direction and weather conditions.

1.5.4 EVACUATION OF WORKERS AND PLANT SHUT DOWN

Evacuation of workers

When the Emergency is declared, all workers will have to leave their places of work and reach the safe place. However, in the confusion and excitement, the workers may not exactly know which path to follow. If it is night time, the paths themselves may not be visible.

Further, when the emergency is in the same section in which a particular worker is working, there will be so much smoke or fumes that it may be difficult for him to find the path of exit and he will require some special guidance. Thus, it is very necessary that there are guide paths for the workers to follow in case of emergency so that they can reach the safe place/gate.

There may be some workers who have been hurt and are unable to come out. To help them, team members will be made available to the incident controller who will send this team with hailers to the plant area along with necessary safety equipment which will be kept ready for use in main control room. This team will pick up those workers who have been hurt and make arrangements to bring them to safe place/Gate.

At the gate, there will be arrangement for counting of the workmen reporting there. All the workers who have arrived at the main gate will be counted against the number which had entered. The total number that has been put together consist not only the workers but also visitors and contract laborers. The special equipment will be made available to the team from control room.

When the injured workers are brought to the safe place/gate, they have to be shifted to the hospitals with or without the help of Police. For this, arrangements will be made for a number of vehicles, ambulances, etc.

If outside public in nearby villages is affected, their evacuation will be done by Police. However, such situation is not envisaged in the DSSSSL plant as there is no habitation near to the plant. The Police will also arrange for temporary shelter and food and will make arrangements to take the public back their residences, after the emergency situation has been controlled. It is wholly necessary that the plant is shut down immediately.

1.5.5 CONTROL OF EMERGENCY

Apart from bringing the injured workers out and looking after their welfare, it will be necessary that emergency be controlled. This will be done under the direction of the incident controller. Work situation control in the plant will be the responsibility of Operations Manager.

1.5.6 EMERGENCY EQUIPMENT

Emergency handling teams will consider maintaining on-site equipment to help mitigate damage. The common practice is to have disaster `bins' at strategic points around the building containing paper towels, plastic sheeting, torches and similar supplies.

Readymade disaster bins and optional extras will be obtained Contents of a disaster recovery bin will include the following:

Recovery bin	CO_2 fire Extinguishers
Blotting paper	bucket butchers paper
Cotton gloves	dust mask
Extension cord	fire blanket
Freezer bags	glove liners
Hand towel	knife
Note pad/folder	Paperclips
Paper towel	pegs
Pencil	plastic canister
Plastic bin liners	plastic sheeting
Post it notes	power board
Rubber gloves	scissors
Sponge	tags/ties torch and
Batteries	apron
Waterproof marking pens	

1.5.7 TRAINING FACILITIES

All employees, including maintenance and contractor employees, involved with highly hazardous chemicals will be made aware of the safety and health hazards of the fuels and processes they work with for the protection of themselves. Training programs will be conducted by DSSSSL.

The purpose of training is to establish and verify the organization's ability to prevent fires and to effectively respond to fire emergencies. Training considerations should include the following:

1. Actions to take in the event of a fire:
   When to evacuate, when to attempt to extinguish a fire, whom to notify, what equipment to shut down.

2. Portable fire extinguishers
   The correct extinguisher and its proper operation on a particular type of fire (e.g., metals, electrical, chemical, wood, or paper). The training should be "hands-on" to give employees experience in extinguishments techniques.

3. Familiarity with plant:
   A tour of the entire facility, with emphasis on the location of exits, fire extinguishers, hazardous operations, and restricted areas.

4. Care and maintenance of equipment or machinery they will be operating:
   To reduce fire loss potential by helping to keep equipment from malfunctioning or breaking down.

5. Alarms
   The meaning of various alarms and the actions to take when they are sounded.

6. Hot-Work Permits
   How to protect against fire hazards caused from welding/cutting/brazing and other hot work.

7. Flammable Liquids:
   How to safely handle, use, and store Flammable liquids.

   The Hazard Communication standard will help employees to be more knowledgeable about the fuels/chemicals they work with as well as familiarize them with reading and understanding MSDS. However, additional training in subjects such as operating procedures and safety work practices, emergency evacuation and response, safety procedures, routine and non routine work authorization activities, and other areas pertinent to process safety and health will be covered by an employer's training program.

   Operating personnel, who will work in a control room or at control panels, will be trained at simulated control panel or panels. Upset conditions of various types could be displayed on the simulator, such that the employee could go through the proper operating procedures to bring the simulator panel back to the normal operating parameters.

   DSSSSL will periodically evaluate their training programs to see if the necessary skills, knowledge and routines are being properly understood and implemented by their trained employees. The means or methods for evaluating the training will be developed along with the training program goals and objectives. Training program evaluation will help DSSSSL to determine the amount of training their employees understood, and whether the desired results were obtained. If, after the evaluation, it appears that the trained employees are not at the level of knowledge and skill that was expected, DSSSSL will revise the training program, provide retraining, or provide more frequent refresher training sessions until the deficiency is resolved.

1.5.8 INTERACTION WITH OUTSIDE AGENCIES

Treatment of affected persons:

Based on the maximum accidental analysis, it is observed that the accidents are mainly confined to plant boundary and will not call for offsite emergency. However, as a safety measure, it is assumed that the accident will call for offsite emergency. In case of offsite emergency, the effects will be felt not only within the plant premises but outside by general public around the factory premises. DSSSSL has provided all first aid facilities and medicines to handle the affected.

Injured persons will be shifted to hospital on urgent basis. DSSSSL will utilize the ambulance services of the nearby hospitals and own vehicles for transport of injured persons. DSSSSL has registered with nearby hospitals to handle the injured cases.

Interaction with Police

DSSSSL has informed / will inform the nearby police station about the nature of possible hazards that can occur.

Interaction with Fire Brigade

DSSSSL along with its own firefighting facility and the service of the nearest fire station will be utilized to bring the situation under control.

1.5.9 INTERACTION WITH PUBLIC & PRESS

Based on the maximum accidental analysis, it is observed that the accidents are mainly confined to plant boundary and will not call for offsite emergency. However, as a safety measure, it is assumed that the accident will call for offsite emergency. In the case of offsite emergency the plant personnel will not interact directly with the public. In such instances, information will be given by Police

Department only. Police Department will be informed about possible hazards.

In case of a major accident, public and press will be informed about the status at different intervals. Apart from this, it will also be necessary to inform the concerned people about the status of the injured. In case of deaths, the bodies of the dead will be handed over to the relatives. These functions will be performed by the police with assistance of the controller of emergency.

Authorised person of DSSSSL will have contact with general public, relatives of workers and representative of the press. DSSSSL will inform the statutory authorities like chief inspector of factories and boilers, State Pollution Control Board to draw their attention to the Declaration of Emergency. This will be done with the help of telephone/telex/messenger.

The controller of Emergency will ensure that the neighboring factories are informed of the emergency on an appropriate basis through phone or messenger.

1.5.10 ALL CLEAR SIGNAL

The moment when the situation of emergency is brought under control, it will be necessary to bring this attention of public, press etc. This will be done by DSSSSL siren.

DSSSSL is already having an approved onsite emergency plan for the existing unit from Director of Factories & Boilers, Government of Karnataka, Bengaluru. The same will be upgraded for the proposed expansion and distillery unit. The necessary approvals will be taken.

1.6 TRAFFIC STUDY

Traffic study of the area for the proposed projects in respect of existing traffic, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.

EXISTING TRAFFIC

The existing traffic in the vicinity of the factory is Indi – Hirebevanur - Gubbewadi road - 630 PCU's per day

ADDITIONAL TRAFFIC

The additional traffic from the project after expansion of sugar & cogeneration units & establishment of distillery are due to transportation of the following materials:

QUANTITY OF ADDITIONAL MATERIAL FOR TRANSPORT (T/DAY)

	Raw Materials	**Finished Product**	**By Products**	**Waste**	**Total**
Sugar Cane	1750 (E)* 3250 (A)**	0	0	0	3250
Coal	120	0	0	0	120
Press Mud	0	0	70(E) 130 (A)	0	130
Ash	0	0	0	4.36 (E) 70.44(A)	70.44
Sugar	0	210 (E) 390(A)	0	0	390
Rectified Spirit	0	60	0	0	60
TOTAL	**3370**	**450**	**130**	**70.44**	**4020.44**

ESTIMATION OF TRUCKS FOR TRANSPORT	
Total additional quantity, tonnes/day	4021
Capacity of each truck, tonnes	10
Number of trucks for total quantity	402
Operational hours for trucks in a day	16
Number of trucks per hour	26

Note: * E – Existing, ** A - Additional

It can be seen from the above table that, the maximum trucks which would add to the existing traffic will be 26 trucks / hour after the proposed expansion & establishment of distillery. Apart from the above, the traffic may be due to the visitors, farmers which is negligible.

PARKING ARRANGEMENT

DSSSSL has provided adequate parking facilities within an area of 1.5 acres (6070 Sq.m) for parking of trucks, visitors vehicles & two wheelers with rest shelters & toilets in the vicinity. These facilities are adequate to handle the additional traffic resulting from the proposed expansion and establishment of distillery.