7.0 ADDITIONAL STUDIES

7.1 Risk Assessment

Risk analysis involves the identification and assessment of risks the persons involved in the proposed expansion activity and the neighboring populations are exposed to as a result of hazard occurrence. This requires a thorough knowledge of failure probability, credible accident scenario, vulnerability of population etc. Much of this information is difficult to get or generate. Consequently, the risk analysis is often confined to maximum credible accident studies.

In the sections below, the identification of various hazards, probable risks in the proposed expansion, maximum credible accident analysis and consequence analysis, which give a broad identification of risks involved, are addressed. Based on the risk estimation for fuel storage, a Disaster Management Plan (DMP) has been presented.

7.1.1 Approach to the Study

Risk involves the occurrence or potential occurrence of some accidents consisting of an event or sequence of events. The risk assessment study covers the following:

- Identification of potential hazard areas;
- Identification of representative failure cases;
- Visualization of the resulting scenarios in terms of fire (thermal radiation) and explosion;
- Assessment of the overall damage potential of the identified hazardous events and the impact zones from the accidental scenarios;
- Assessment of the overall suitability of the site from hazard minimization and disaster mitigation points of view;
- Furnishing specific recommendations on the minimization of the worst accident possibilities; and
- Preparation of broad Disaster Management Plan (DMP), On-site and Off-site Emergency Plan, which includes Occupational and Health Safety Plan.

7.1.2 Hazard Identification

Identification of hazards in the steel industry expansion is of primary significance in the analysis, quantification and cost effective control of accidents involving HSD. A classical definition of hazard states that hazard is in fact the characteristic that presents potential for an accident. Hence, the components of the proposed expansion activity need to be thoroughly examined to assess their potential for initiating or propagating an unplanned event/sequence of events, which can be termed as an accident. The following two methods for hazard identification have been employed in the study:

- Identification of major hazardous units based on Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 of Government of India (GOI Rules, 1989); and
- Identification of hazardous units and storage units based on relative ranking technique, viz. Fire-Explosion and Toxicity Index (FE&TI).

7.1.3 Identification of Major Hazardous Units

Hazardous substances may be classified into three main classes such as flammable substances and unstable substances and toxic substances. The ratings for a large number of chemicals/substances based on flammability, reactivity and toxicity have been given in NFPA Codes 49 and 345 M. In the proposed project expansion, HSD will be stored in-built tank of DG set for generation of power in case of grid failure. The details of HSD storage and its classification as per GOI rules are given in **Table-7.1**. Hazardous characteristics of HSD are listed in **Table-7.2**.

TABLE-7.1
APPLICABILITY OF GOI RULES TO FUEL

Sr. No.	Chemical/ Fuel	Listed in Schedule	Storage	Threshold Quantity (T) for Application of Rules	
				5,7-9,13-15	10-12
1	HSD	3 (1)	100 Lit – Inbuilt storage within DG set	25 MT	200 MT

TABLE-7.2
PROPERTIES OF STORAGE FUELS

Chemical/ Fuel	Codes/Label	TLV	FBP	MP	FP	UEL	LEL
			°C			%	
HSD	Flammable	5 mg/m^3	369	338	32.9	7.5	0.6

TLV : Threshold Limit Value
FBP : Final Boiling Point
MP : Melting Point
FP : Flash Point
UEL : Upper Explosive Limit
LEL : Lower Explosive Limit

7.1.4 Common Causes of Accidents

Based on the analysis of past accident information, common causes of accidents are identified as:

- Poor housekeeping;
- Improper use of tools, equipment, facilities;
- Unsafe or defective equipment facilities;
- Lack of proper procedures;
- Failure to follow prescribed procedures;
- Jobs not understood;
- Lack of awareness of involved hazards;
- Lack of guides and safety devices; and
- Lack of protective equipment and clothing.

7.1.5 Failures of Human Systems

Major causes of human failures reported are due to:

- Stress induced by poor equipment design, unfavorable environmental conditions, fatigue, etc.;
- Lack of training in safety and loss prevention;
- Indecision in critical situations; and
- Inexperienced staff being employed in hazardous situations.

Often, human errors are not analyzed while accident reporting and accident reports only provide information about equipment and/or component failures. Hence, a great deal of uncertainty surrounds analysis of failure of human systems and consequent damages.

7.2 Hazard Assessment and Evaluation

7.2.1 Introduction

An assessment of the conceptual design is conducted for the purpose of identifying and examining hazards related to utility and support systems, environmental factors, facilities and safeguards.

7.2.2 Methodology

An assessment of the conceptual design is conducted for the purpose of identifying and examining hazards related to utility and support systems, environmental factors, facilities, and safeguards.

7.2.3 Preliminary Hazard Analysis (PHA)

A preliminary hazard analysis is carried out initially to identify the major hazards associated with storages in the proposed expansion activity. This is followed by consequence analysis to quantify these hazards. No major hazards with potential for any emergency situation exist in the project site. The other hazards related to the storage areas are given below in **Table-7.3** and the preliminary hazard analysis for the proposed expansion activity is given in **Table-7.4.**

7.2.4 Maximum Credible Accident Analysis (MCAA)

Hazardous substances may be released as a result of failures or catastrophes, causing possible damage to the surrounding area.

TABLE-7.3
PRELIMINARY HAZARD ANALYSIS FOR PROCESS AND STORAGE AREAS

Equipment	Process	Potential Hazard	Provision
Diesel Generator	Converts mechanical energy into electrical energy.	Mechanical hazards and fire hazards in • Lube oil system • Cable galleries • Short circuits	As above
Power Transformers	-	Fire and explosion	All electrical fittings and cables are provided as per the specified standards.
Switch Yard control room	-	Fire in cable galleries and switch	As above
HSD Storage within DG set	Used as fuel for DG set.	Fire & explosion	Leaks detection system will be provided.

TABLE-7.4
PRELIMINARY HAZARD ANALYSIS IN GENERAL

PHA Category	Description of Plausible Hazard	Recommendation	Provision
Environ-mental factors	If there is any leakage and eventuality of source of ignition.	-	All electrical fittings and cables will be provided as per the specified standards. All motor starters are flame proof.
	Highly inflammable nature of fuels may cause fire hazard in the storage facility.	A well designed fire protection including protein foam, dry powder, CO_2 extinguisher should be provided.	Fire extinguisher of small size and big size are provided at all potential fire hazard places. In addition to the above, fire hydrant network is also provided.

A disastrous situation may arise due to outcome of fire, explosion or toxic hazards in addition to other natural causes, which eventually lead to loss of life, property and ecological imbalance. Major hazards posed by flammable storage can be identified taking recourse to MCA analysis. Depending upon the effective hazardous attributes and their impact on the event, the maximum effect on the surrounding environment and the respective damage caused can be assessed.

The results of consequence analysis are useful for getting information about all known and unknown effects that are of importance when some failure scenario occurs in the proposed expansion activity and also to get information as how to deal with the possible catastrophic events. It also gives the residents in the project and people living in the vicinity of the area, an understanding of their personal situation.

Damage Criteria

The Inbuilt storage of HSD in the DG Set and unloading facility may lead to fire and explosion hazards. The damage criteria due to accidental release of any hydrocarbon arise from fire and explosion. The vapors of these fuels are not toxic and hence no effects of toxicity are expected.

Tank fire will occur if the radiation intensity is high on the peripheral surface of the tank leading to increase in internal tank pressure. Pool fire will occur when fuel collected in the dyke due to leakage gets ignited.

- **Fire Damage**

A flammable liquid in a pool will burn with a large turbulent diffusion flame. This releases heat based on the heat of combustion and the burning rate of the liquid. A part of the heat is radiated while the rest is convicted away by rising hot air and combustion products. The radiations can heat the contents of a nearby storage or process unit to above its ignition temperature and thus result in a spread of fire. The radiations can also cause severe burns or fatalities of workers or fire fighters located within a certain distance. Hence, it will be important to know beforehand the damage potential of a flammable liquid pool likely to be created due to leakage or catastrophic failure of a storage or process vessel. This will help to decide the location of other storage vessels and decide the type of protective clothing the workers/fire fighters need, the duration of time for which they can be in the zone, the fire extinguishing measures needed and the protection methods needed for the nearby storage/process vessels. The damage effects on people and equipment due to thermal radiation intensity are presented in **Tables-7.5** and **Table-7.6** respectively.

TABLE-7.5
DAMAGE DUE TO INCIDENT RADIATION INTENSITIES

Sr. No.	Incident Radiation (kW/m^2)	Type of Damage Intensity	
		Damage to Equipment	**Damage to People**
1.	37.5	Damage to process equipment	100% lethality in 1 min. 1% lethality in 10 sec.
2.	25.0	Minimum energy required to ignite wood at indefinitely long exposure without a flame	50% Lethality in 1 min. Significant injury in 10 sec.
3.	19.0	Maximum thermal radiation intensity allowed on thermally unprotected adjoining equipment	-
4.	12.5	Minimum energy to ignite with a flame; melts plastic tubing	1% lethality in 1 min.
5.	4.5	-	Causes pain if duration is longer than 20 sec, however blistering is un-likely (First degree burns)
6.	1.6	-	Causes no discomfort on long exposures

Source: Techniques for Assessing Industrial Hazards by World Bank

The effect of incident radiation intensity and exposure time on lethality is given in **Table-6.6**.

TABLE-7.6
RADIATION EXPOSURE AND LETHALITY

Radiation Intensity (kW/m^2)	Exposure Time (seconds)	Lethality (%)	Degree of Burns
1.6	--	0	No Discomfort even after long exposure
4.5	20	0	1st
4.5	50	0	1st
8.0	20	0	1st
8.0	50	<1	3rd
8.0	60	<1	3rd
12.0	20	<1	2nd
12.0	50	8	3rd
12.5	--	1	--
25.0	--	50	--
37.5	--	100	--

The Diesel is stored within the in-built storage tank so external storage is fuel is not necessary hence risk assessment has not been carried

7.2.5 Identification of Hazards, Assessment and their Management

The various hazards associated, apart from fuel storage with the plant process has been identified and has outlined in **Table-7.7.**

TABLE-7.7
HAZARD ANALYSIS FOR PROCESS IN STEEL PLANT

Sr. No.	Blocks/Areas	Hazards Identified
1	Induction furnace	Liquid metal
2	Switch-yard Control Room	Fire in cable galleries and Switch-gear/Control Room

7.2.7 Hazardous Events with Greatest Contribution to Fatality Risk

The hazardous event scenarios likely to make the greatest contribution to the risk of potential fatalities are summarized in **Table-7.8**. 'Onsite facility' refers to the operating site at AAP, whereas 'offsite facility' refers to transport and handling systems, which are away from the AAP operating site.

TABLE-7.8
HAZARDOUS EVENTS CONTRIBUTING TO ON-SITE FACILITY RISK

Hazardous Event	Risk Rank	Consequences of Interest
Onsite vehicle impact on personnel	3	Potential for single fatalities, onsite impact only
Entrapment/struck by Machinery	3	Potential for single fatalities, onsite impact only
Fall from heights	3	Potential for single fatalities, onsite impact only
Electrocution	3	Potential for single fatalities, onsite impact only
Storage stack collapse	3	Potential for single fatalities, onsite impact only

7.2.8 Risk Assessment Summary

The preliminary risk assessment has been completed for the proposed expansion of steel plant and associated facilities:

- There will be no significant community impacts or environmental damage consequences; and

- The hazardous event scenarios and risks in general at this facility can be adequately managed to acceptable levels by performing the recommended safety studies as part of detailed design, applying recommended control strategies and implementing a Safety Management System.

7.2.9 Recommended Approach to Combat with the Possible Accidents

Considering all possible accident scenarios as analysed in the risk analysis, it is established that there will not be any major potential hazards in the project causing major damages inside and outside the boundary. In spite of this, the project authorities should be well prepared to handle any such eventuality as described below:

In case of Explosion:

The following measures and actions are to be taken:

- Evacuate the area in vicinity;
- Take all necessary actions to avoid escalation of the accident;
- If problem appears to be out of control, call fire brigade and police. Report to district collector, etc.; and
- Provide first aid to the victims as suggested in the Material Safety Data Sheets.

Spillage due to storage tank rupture or tanker failure

This accident scenario has considerable damage potential. In such scenario the following steps should be taken:

- Contain fuel supply to the tankers;
- Determine the extent of damage; and
- Undertake all the emergency actions mentioned above.

Spillage from Storage tank, storage tank/tanker overfilling, pipe-hose rupture

In addition the measure stated above, the following actions are to be taken:

- Stop further process of filling immediately;
- Note the amount of fuel spilled in the area;
- If the tanker is on the road, communicate about the accident to the traffic police; and
- Take help of the traffic police for preliminary emergency actions.

Major Spillage due to storage tank rupture or tanker failure

This accident scenario has considerable damage potential. In such case the following steps have to be taken up:

- Determine the extent of damage;
- Contain fuel supply to HSD tanks; and
- Undertake all the emergency actions mentioned above.

➢ ***Accident Involving HSD***

In case of leakage of oil from flanges, valves, tail ends or during transfer from truck tanker (TTS):

- Detect the source of leakage;
- If possible, try to collect the leaking oil in a suitable container;
- Bring portable fire extinguishers near to the area of leakage; and
- Stop flow of spilled oil and prevent it from coming into contact with any ignition source.

If HSD is ignited at the source of leak:

In addition to the above, following actions are to be taken:

- Use fire extinguishers to diminish the fire;
- See that the flame does not impinge on tanks or any other adjacent installation;
- If impingement of flame is unavoidable, put water curtain in between and cool the adjacent installations;
- Give priority to closure of valve and stop the flow;
- Best trained personnel to prevent further spread of fire;
- Take all necessary actions to avoid escalation of the accident; and
- In case of fire, ensure suffocation and toxicity due to flame does not take place.

In case of fire near HSD storage tanks:

- If the fire is near the storage tanks area, use water hydrant and DCP type fire extinguishers;
- Never allow fire to spread to the area below the tank, start cooling the tank by the emergency water spray; and
- Call fire brigade & police for assistance.

7.3 Disaster Management Plan

A disaster is a catastrophic situation in which suddenly, people are plunged into helplessness and suffering, as a result, need protection, clothing, shelter, medical and social care and other necessities of life.

Disasters can be divided into two main groups. In the first, disasters resulting from natural phenomena like earthquakes, volcanic eruptions, storm surges, cyclones, tropical storms, floods, avalanches, landslides, forest fires etc. The second group includes disastrous events occasioned by man, or man's impact upon the environment. Examples are armed conflict, radiation accidents, campus fires, river pollution, air, sea, rail and road transport accidents and can reach catastrophic dimensions in terms of human loss.

There can be no set criteria for assessing the gravity of a disaster in the abstract since this depends to a large extent on the physical, economic and social environment in which it occurs. What would be considered a major disaster in a developing country, ill-equipped to cope with the problems involved may not mean more than a temporary emergency elsewhere. However, all disaster brings in their wake similar consequences that call for immediate action, whether at the local, national or international level, for the rescue and relief of the victims.

This includes the search for the dead and injured and removal of debris and social care, the provision of temporary shelter to the homeless food, clothing and medical supplies, and the rapid re-establishment of essential services.

7.3.1 Objectives of Disaster Management Plan (DMP)

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of the Disaster Management Plan, it will be widely circulated and personnel training given through rehearsals/drills.

The Disaster Management Plan would reflect the probable, consequential severalties of the undesired event due to deteriorating conditions or through 'Knock on' effects. Further the management should be able to demonstrate that their assessment of the consequences uses good supporting evidence and is based on currently available and reliable information, incident data from internal and external sources and if necessary the reports of outside agencies.

To tackle the consequences of a major emergency inside the factory or immediate

vicinity of the factory, a Disaster Management Plan has to be formulated and this planned emergency document is called "Disaster Management Plan".
The objective of the Disaster Management Plan is to make use of the combine resources of the plant and the outside services to achieve the following:

- Effect the rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Identify any dead;
- Provide for needs of relatives;
- Provide authoritative information to the news media;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the Emergency.

In effect, it is to optimize operational efficiency to rescue rehabilitation and render medical help and to restore normalcy.

7.4 Social Impact Assessment

The impact of the proposed expansion activity will begin with the starting up of the construction activities at the site. The proposed expansion activity will provide employment to considerable number of skilled, semi-skilled and un-skilled construction labourers. In normal circumstances, the local people will be given preference for the unskilled activities, as there are many construction laborers in the vicinity of the project and are expected to be available with normal wages.

Presently, a large number of skilled and semi-skilled technicians and labourers who in-migrated from various parts of India have been engaged in many companies on wages/contract basis.

Similar technicians and skilled workers will either be brought or sourced from the local area for erection of the proposed expansion activity.

The peak labour force required during the construction period will be about 1000 per day and it is anticipated that about two thirds of the labour force will be sourced from the local area. Provision of wage employment to the local populace during construction period of the project will benefit the local area to some extent. This will enhance the income levels of the construction labourers and lead for their socio-economic wellbeing during the construction phase of the proposed expansion activity, which will be positive impact due to the project. In addition, the real estate in the region will get a boon and the land prices are likely to shoot-up as part of speculation.

Normally, the construction activity will benefit the local populace in a number of ways, which include the requirement of skilled, semi-skilled and un-skilled construction labourers, tertiary sector employment and provision of goods and services for daily needs including transport.

In line with the above, some more recommendations are given below:

- Local people will be given preference;
- All the guidelines under the Labour Act and Safety Rules as specified under Factories Act, 1948 will be implemented during the construction work to avoid any accidents;
- The contractor will be instructed to provide cooking fuel to the workers to prevent damage to trees. This will be part of the contractual agreement between the project proponent and the contractor engaged for construction; and
- The construction site will be secured with fencing and will have guarded entry points.

7.5 Rehabilitation & Resettlement Action Plans

The proposed activity activity does not involve any Rehabilitation & Resettlement issues, as the entire erection activities will be carried out in the land which was already under the ownership of the promoters.

7.6 Traffic Management system

This data illustrates the study of existing & proposed traffic levels at selected junctions from the plant site. The location of the existing plant is given below

7.6.1 Location details

TABLE-7.9
DETAILS OF THE PLANT LOCATION

Sr. No.	Particulars	Details		
1.	Site co-ordinates	**Points**	**Latitude**	**Longitude**
		A	13°25.120' N	80°06.878' E
		B	13°25.069' N	80°06.878' E
		C	13°25.097' N	80°06.776' E
		D	13°25.134' N	80°06.778' E
2.	Elevation above MSL	19 AMSL		
3.	Nearest Highway	NH-5 (0.6 km, East)		
4.	Nearest Railway Station	Gummidipoondi R.S. (1.27 km, SE)		
5.	Nearest Airport	Chennai Intl. Airport (47.2 km, South)		
6.	Seismicity Zone	Zone-III as per IS: 1893 (Part-1) 2002		

7.6.2 Data generation

The vehicles passing through the road (in both ways) were counted separately for 24 hours at one selected location from 0600 hrs to 0600 hrs next day continuously. Category-wise vehicle counting has been done continuously and recorded in the traffic volume count on hourly basis under respective categories.

7.6.2.1 Road Connectivity to the project

The project is located at 0.6 km distance from NH-5 which is Chennai – Guntur Highway. The traffic generated by the proposed project expansion will added to the existing traffic. Though pressure develops, the connecting road is sufficient to handle the pressure.

7.6.2.2 Categorization of Traffic

The engine driven vehicles were categorized into various heads viz. Trucks/Bus, Light Carriage Vehicles (LCV), Car/Jeep, Multi Axle Vehicles, Two/Three Wheelers and Cycles/others.

7.6.2.3 Sampling Locations

The one location is represented in **Table-7.10**

TABLE-7.10
DETAILS OF THE TRAFFIC MONITORING LOCATION

Location Code	Location Details
T-1	Chennai- Guntur Highway

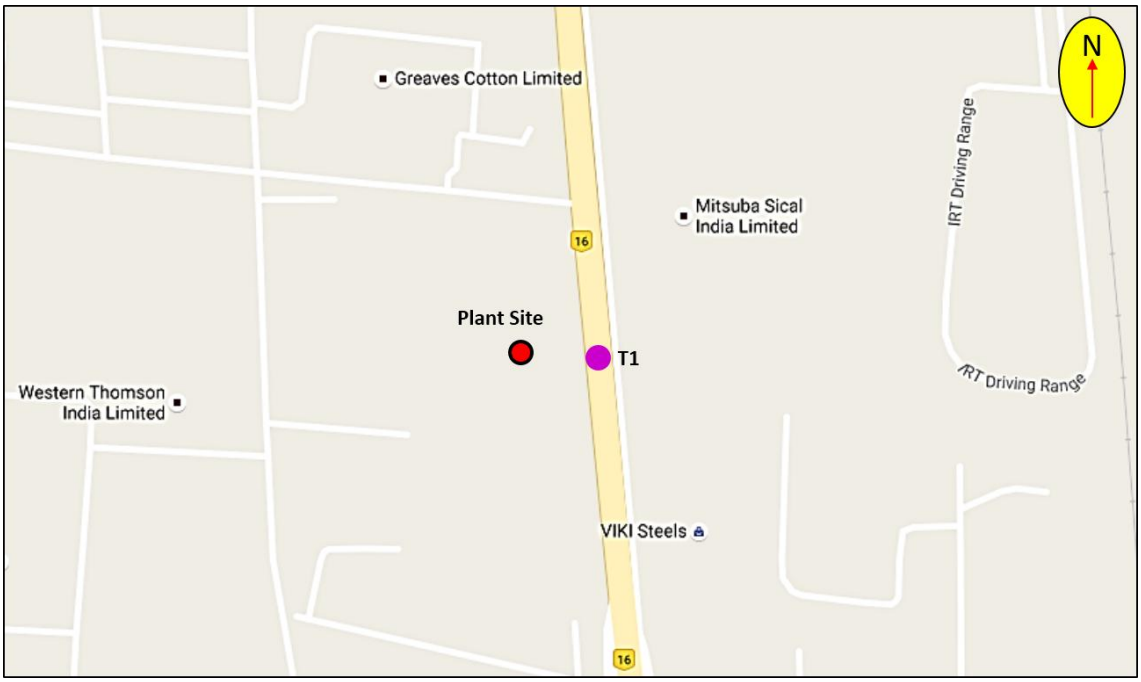


FIGURE-7.1
TRAFFIC MONITORING LOCATIONS

TABLE-7.11
ROAD GEOMETRIC SCENARIO

Road	Road width (m)	Lanes	Surface Condition	Street lights	Road Markings	Road signs	Remarks
Chennai – Guntur Hwy	14	4	Good	A	A	A	Divided road with street lights

TABLE-7.12
IRC GUIDELINES

No of traffic lanes and widths	Traffic flow	Capacity in PCU's per hour for various traffic conditions		
		Roads with no frontage access, no standing vehicles, very little cross traffic	Roads with frontage access but no standing vehicles and high capacity intersections	Roads with free frontage access, parked vehicles and heavy cross traffic
2 - lane (7 – 7.5 m)	One way Two way	2400 1500	1500 1200	1200 750
3 – lane (10.5 m)	One way	3600	2500	2000
4 - lane (14 m)	One way Two way	4800 4000	3000 2500	2400 2000
6 – lane (21 m)	One way* Two way	3600 6000	2500 4200	2200 3600
*denotes for three lanes in predominant direction of flow				

TABLE-7.13
IRC – LOS GUIDELINES

V/C	LOS	Performance
0.0 - 0.2	A	Excellent
0.2 - 0.4	B	Very Good
0.4 - 0.6	C	Good / Average / Fair
0.6 - 0.8	D	Poor
0.8 - 1.0	E	Very Poor
1.0 & above	F	Worst

V= Volume in PCUs/hr & C= Capacity in PCUs/ hr
** Note: Capacity as per IRC Guidelines*

The hourly vehicular traffic densities for continuous normal day at each location observed during the study period and the same are presented in **Table-7.14, 7.15 & 7.16**.

Location Number : T-1
Details of Location : Chennai – Guntur Hwy (NH-5)

TABLE-7.14
TRAFFIC DENSITIES

Time	Two Wheeler	Auto Rickshaw	Car/ Utility	Buses	Trucks	Total Vehicles	Total PCUs
06-07	12	6	5	10	12	73	80
07-08	16	5	6	12	10	130	82.5
08-09	19	19	5	18	11	158	111
09-10	22	12	13	14	11	178	105
10-11	26	5	14	10	12	193	95.5
11-12	19	3	10	9	11	183	81
12-13	18	5	12	15	16	143	116.5
13-14	11	4	9	18	12	154	106.5
14-15	9	1	8	10	11	166	76
15-16	7	0	11	12	12	175	86.5
16-17	8	2	12	6	15	179	80
17-18	26	4	16	14	13	160	112
18-19	16	4	11	16	15	165	114
19-20	21	6	16	9	14	207	98.5
20-21	18	3	11	12	16	233	105.5
21-22	11	1	9	15	16	188	108
22-23	9	0	6	16	14	86	100.5
23-24	9	0	9	14	15	63	100.5
24-01	7	1	6	13	14	51	91
01-02	6	0	0	11	16	47	84
02-03	5	0	1	13	14	42	84.5
03-04	1	0	6	17	15	53	102.5
04-05	4	2	4	18	15	68	106
05-06	4	3	5	10	14	73	80.5
Total	304	86	205	312	324	3168	2308

TABLE-7.15
TRUCK DETAILS

Sr. No.	Materials	Quantity (TPD)		Trucks (Nos.)	
		Existing	After expansion	Existing	After expansion
1.	MS Scrap	56	247	3	15
2.	Silico manganese	3	14	0	1
3.	Sponge iron	7	29	0	2
4.	MS Billets	64	284	4	18
5.	Furnace slag	1	6	0	0

TABLE-7.16
EXISTING TRAFFIC SCENARIO

Road	V	C*	Existing V/C Ratio	LOS
Chennai – Guntur Hwy (NH-5)	120 (96+24)	4000	0.03	A

V= Volume in PCUs/hr & C= Capacity in PCUs/ hr
** Note: Capacity as per IRC Guidelines*

7.6.3 Traffic flow Assessment

Considering the industrial activity the ingress & egress of vehicles to the existing premise from evening to morning is 24 PCU. Along with the existing traffic (96 PCU) of NH-5, the total traffic generated in NH-5 during existing plant premise is 104 PCU's/hr. As per the present scenario, 100% of the generated traffic will move towards T1. Accordingly this is added to the existing peak traffic taking place along these two roads to obtain the impact on traffic due to the industry

TABLE-7.17
TRAFFIC SCENARIO – AFTER EXPANSION

Road	V	C*	Modified V/C Ratio	LOS
Chennai – Guntur Hwy (NH-5)	96+108=204	4000	0.05	A

V= Volume in PCUs/hr & C= Capacity in PCUs/ hr
** Note: Capacity as per IRC Guidelines*

After the proposed expansion the traffic generated due to the industrial activity would be 108 PCU. On combining with the existing traffic condition, the V/C ratio was found to be 0.05 and Level of Service is Excellent.

7.6.4 Conclusion

The existing level of service (LOS) of the Chennai – Guntur Hwy (NH-5) is **'A'** which is excellent. After considering the transportation of trucks due to the proposed project expansion, meagre impact was envisaged. The level of service predicted to be **'A' (Excellent)** even after the proposed expansion.

7.7 Public Hearing

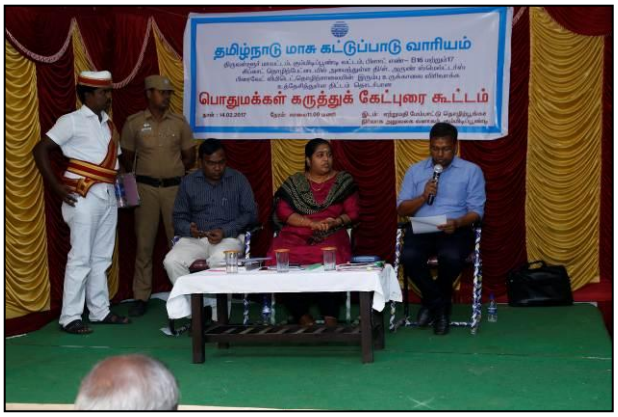
The public hearing meeting for the proposed expansion of steel melting plant by M/s. Arun Smelters Pvt. Ltd was held on 14.02.2017 at Export Promotion Industrial Park - Hall, SIPCOT Complex, Gummidipoondi Taluk, Tiruvallur District as per Environmental Impact Assessment Notification dated 14th September 2006.

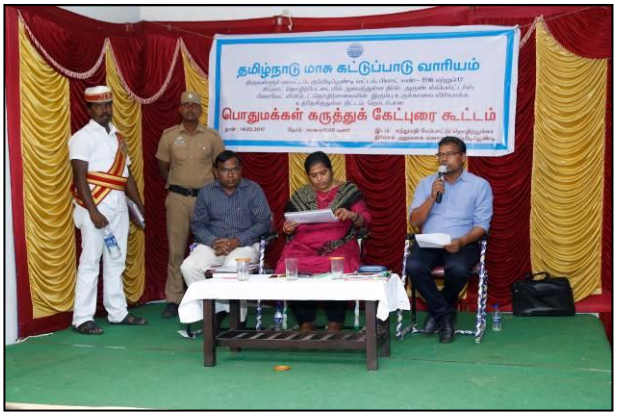
The press notification indicating date and venue of the public hearing was issued by Tamil Nadu Pollution Control Board on 11th January 2017 in "Dinamani" (Tamil daily) and "The New Indian Express" (English daily) with project details inviting suggestions,

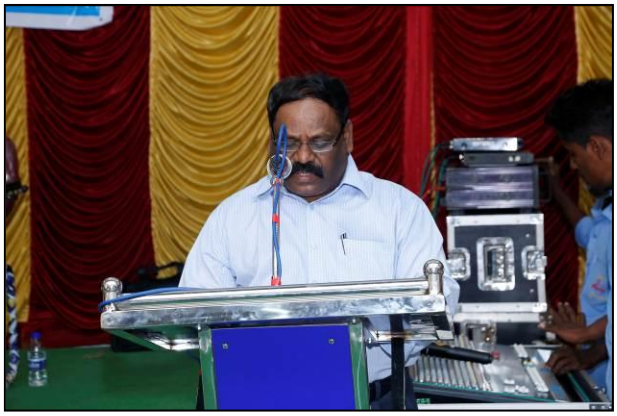
views, comments and objections to the project related to the proposed expansion of steel melting plant by M/s. Arun Smelters Pvt. Ltd at plot no. B16, B17, SIPCOT Industrial complex, Gummidipoondi, Tiruvallur District. The EIA reports along with Executive Summary in English and Tamil were displayed and made available at the District administration office and in District Pollution Control Board office at Tiruvallur.

Public Hearing meeting was chaired by Tmt. E.Sundaravalli, I.A.S, District Collector/District Magistrate, Tiruvallur. Thiru. K. Prakash M.Tech, District Environmental Engineer, TNPCB convened the meeting and requested the representative of M/s. Arun Smelters Pvt. Ltd to explain the salient features of project and specific reference to the impacts of project to the environment and its management measures.

After the project explanation, the district collector invited the public to express their concerns, views and suggestions on this proposal. The copy of newspaper advertisements is attached as shown below. Photographs of Public hearing are presented in **Figure-7.2(A), 7.2(B) & 7.2(C).** Minutes of Public hearing is tabulated in **Table-7.18** and attached in **Annexure-17.**







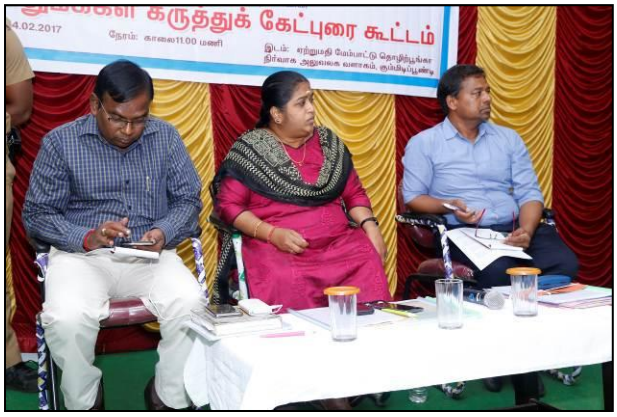


TABLE-7.2(A) – PHOTOGRAPHS OF PUBLIC HEARING

TABLE-7.2(B)
PHOTOGRAPHS OF PUBLIC HEARING

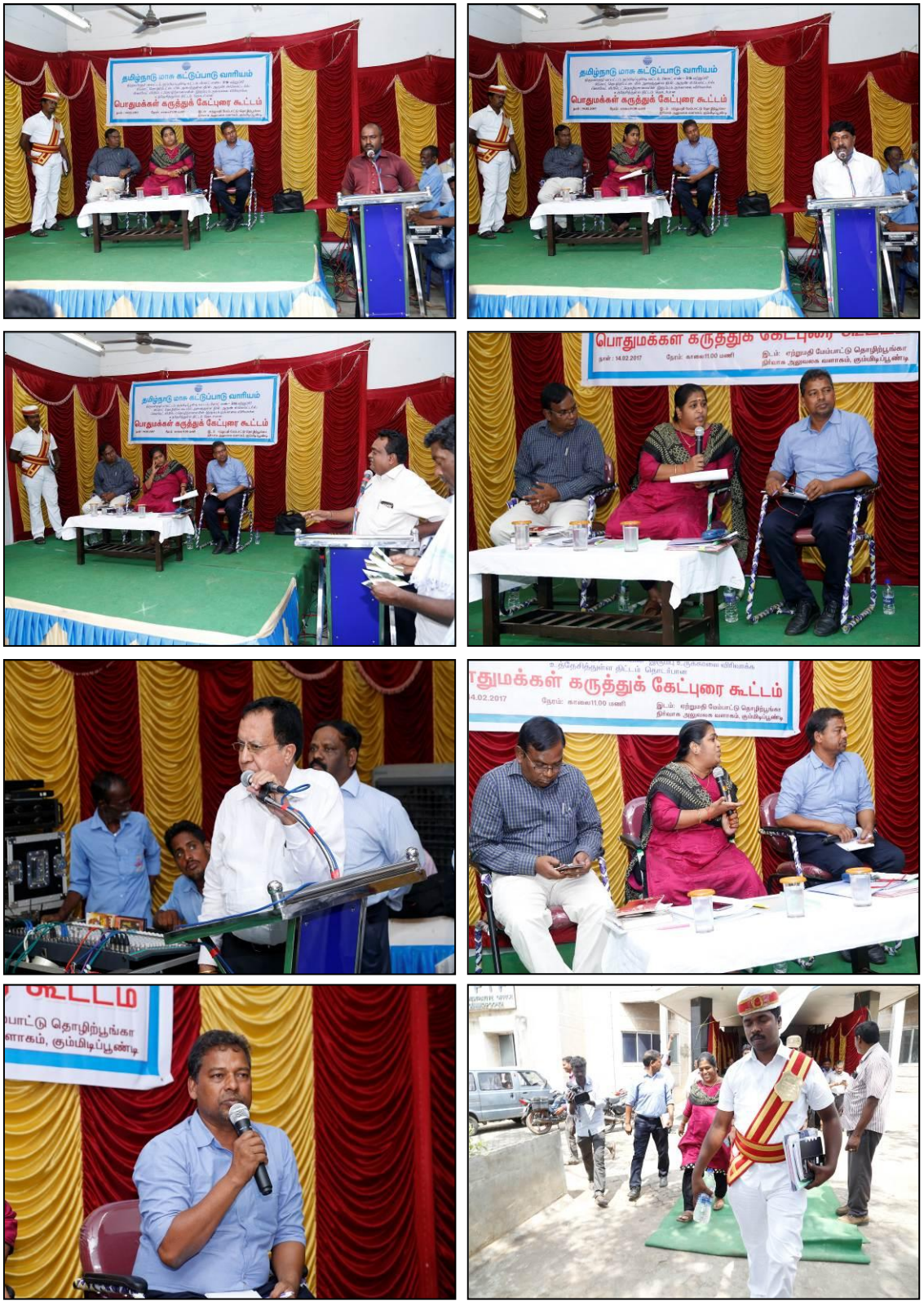


TABLE-7.2(C)
PHOTOGRAPHS OF PUBLIC HEARING

TABLE-7.18
ISSUES RAISED BY PARTICIPANTS DURING PUBLIC HEARING

Sr.No	Issued raised by	Comment/ concern raised	Reply by proponent
1	Mr. Sunanda Reddy, NGO	He stated that the industry shall allot fund for the health check-up of nearby village people and added that the employment opportunities should be provided to the local people who are eligible. He added that the pollution levels should be controlled by the industry, as the neighbouring villages have already been affected. In view of this, he asked the project proponent to protect ground water, conserve rain water through the development of rain water harvesting structures and develop adequate greenbelt within the industry premises.	All the suggestion will be considered during commissioning and operation phase of the industry
2	Mr. C. Murali, S.R. Kandigai	He said that the people are suffering a lot of health issues, such as Kidney failure, Breathing problems and Cancer, as a result of the air pollution caused by the industries located in and around the SIPCOT industrial complex but there was no response from the industries. He furnished the report obtained from IIT, Madras in the neighbouring village of Gummidipoondi on air pollution and added that agriculture has been affected and only North Indians are given employment in these industries. He asked the industries to reduce the exploitation of ground water, as the ground water levels have already gone down alarmingly, in the surrounding villages and also said that the slag from the industries is	

		disposed in the nearby villages. In view of the above, he concluded that such industries should not be allowed to operate. District collector, Tiruvallur intervened & informed that this public hearing is to only for the issues related to the expansion of M/s. Arun Smelters Pvt. Ltd. Please stick on to the comments and suggestions pertaining to this unit only	
3	Mr. D. Jayachandran, Pappankuppam	He said that the information regarding the Public hearing was not available in advance. He also said that the air pollution control measures were not in operation in the industry and dense smoke was noticed all over the roof top, which reduced the visibility in the adjacent NH road. He commented that the Ambient Air Quality survey conducted by the industry was against the prevailing wind direction. Regarding the status of the employees, he said that they were made to work for 12 hours which is against the law, with very less salary. He said that though around 50 engineers are available in the nearby villages, no employment opportunities were given to them. He also added that the water levels have reached lower than 120 feet below the ground level, due to the extraction of ground water. He asked not to allow the proposed expansion because of the air pollution.	Proper intimation about the public hearing has been made in English and Tamil dailies on 11.01.2017. The air pollution control measures were carried out in the existing industry to reduce the air pollution from induction furnace. Scrubber and stack of adequate height was provided. The ambient air quality stations were fixed based on the wind data provided by Indian Meteorological Department. People in local habitations are recruited based on skill & performance. The working people has been provided with salaries based on their qualification & performance. Also, the water for the existing and after expansion of th e industry are sourced from SIPCOT water supply.
4	Mr. M. Jayachandran, Sinthalakuppam	He said that there is only one main school called St. Mary's High School in Sinthalakuppam and all the students of SR Kandigai, GR Kandigai, Pappankuppam and Sinthalakuppam have been studying in that school and no other schools are	

		available. He too said that the information regarding the Public hearing was not available and added that the ground water has been depleted, which has affected the agriculture. He further added that the ground water and air in the SIPCOT has been totally affected and the TNPCB officials has not controlled the pollution in air and water. He finally requested the District Collector and TNPCB officials to take measures to control pollution. District collector, Tiruvallur intervened and informed that this public hearing is to record the views of the public about the project and the recorded minutes with the audio and video will be sent to the Ministry of Environment, Forests & Climate Change for further course of action	
5	Mr. Vijaysarathi, Gummidipoondi	He said that the air pollution has exceeded beyond the permissible level due to the SIPCOT industrial complex. He explained the study conducted by IIT, Chennai regarding air pollution which shows the levels of PM_{10}, $PM_{2.5}$, SO_x and NO_x are presented in alarming levels. [The Pamphlet has been attached.] He said that no industry located in the surrounding have complied to the conditions in the Consent Order and said that the conditions should be checked thoroughly. He further commented that the local people are not given employment and concluded by saying that only green category industries should be allowed in future.	The concentration of air pollutants during the ambient air quality survey taken during baseline study period complied with the NAAQS limits. The compliance of the existing plant has been inspected frequently by TNPCB and the corresponding management practise will be taken for best manufacturing practises. The existing industry recruited the local inhabitants for the plant, even in the proposed expansion, considerable skilled people will be recruited.

6	Mr.K.Poornachandran, Sinthalakuppam	He said that they are purchasing water for drinking due to ground water pollution and that employment opportunity was not given to the local public.	The existing industry doesn't discharge any wastewater outside the unit. Even in the proposed expansion the industry doesn't proposed anything to discharge wastewater outside the premise
7	Mr. E. Rajendran, Pappankuppam	He said that the date and venue of the Public hearing was not properly informed and that they are purchasing drinking water. He said the method of collection of data for the EIA report should be checked. He also observed that the existing air pollution control measures were not operated properly and the employees were not provided with safety measures. He said that all the lorries/trucks were parked nearby the areas, affecting the livelihoods and that the expansion should not be allowed.	Proper intimation about the public hearing has been made in English and Tamil dailies on 11.01.2017. The EIA report has been made based on the TOR provided by the Expert Appraisal Committee, Industrial Committee-I, MoEF&CC, New Delhi. The existing doesn't allow any transporters to park the vehicles outside the premises.
8	Mr. E. Venkatesh, S.R. Kandigai	He said that the industries are not following the pollution standards and that the ambient air quality should be checked in front of people only. He added that the existing stack height of the industry should be raised and 80% of the employment should be given to the people in local villages. He further insisted to control the pollution, as the air, water and land is worst affected in the surrounding villages.	The industry has been following the environmental norms set by CPCB and MoEF&CC. existing stacks have been provided with stacks of adequate height for wide dispersion of flue gases. Adequate air pollution measures will be taken after expansion to mitigate the air pollution
9	Mr. TG. Murali, Pappankuppam	He said that they have been raising objections to the establishment of most of the industries, in the Public hearing but the clearance has been given to those industries without considering the grievances of the people. He asked to stop all the polluting industries in this area.	The industry is located in SIPCOT industrial complex, We strive our best to mitigate the pollution from our premises to the nearby habitation.

10	Mr. Prabhahar Reddy, G.R. Kandigai	He said there should be industrial growth in the region and welcomed the industries established in the SIPCOT industrial complex. He simultaneously requested to control the air pollution from the industry and to give top priority to the nearby village people for employment. Further, representatives from villages insisted and requested the District Collector to have proper control over pollution and asked to avoid pollution of water and air in the industrial complex by the industries at SIPCOT industrial complex, Gummidipoondi with due consideration of the welfare of the people in the surrounding villages.	Suitable air pollution measures like providing hoods, scrubber, adequate stack height will be provided for induction furnaces. Greenbelt will be maintained to mitigate the fugitive emissions.
11	Mr. Umesh Madan, Director, Arun Smelters Private Limited	After the above views, opinions and questions raised by the public, the project proponent Mr. Umesh Madan gave the following reply:	He said that the job opportunities and other grievances by the people have been considered and all the air pollution control systems will be operated continuously.