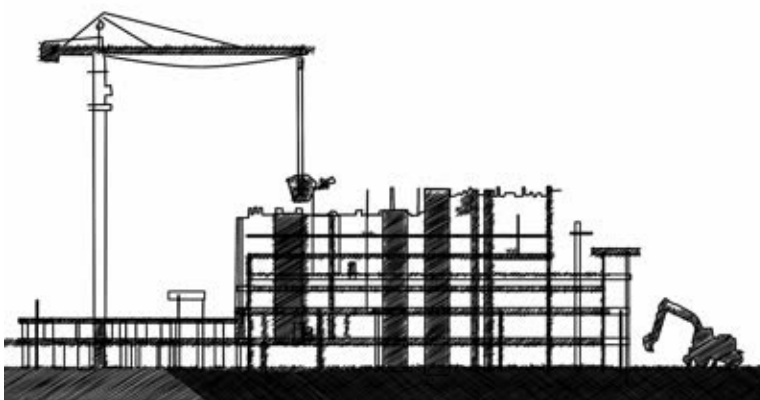




HSE PROCEDURE

FOR

**REGISTER OF
ENVIRONMENTAL
ASPECTS AND
IMPACTS**

**INDUSTRIAL
SYSTEMS GROUP**

HSE PROCEDURE
FOR
REGISTER OF ENVIRONMENTAL ASPECTS AND
IMPACTS
(HSEP: 02)



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BHARAT HEAVY ELECTRICALS LIMITED

INDUSTRIAL SYSTEMS GROUP

 ISG	HSE PROCEDURE FOR REGISTER OF ENVIRONMENTAL ASPECTS AND IMPACTS	Doc. No : HSEP:02 Rev. No : 00 Date : 10.01.2018 Page : 1 of 4
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1.0 OBJECTIVE

To identify the Environmental Aspects of various activities, products and services of and Industrial systems group to evaluate the impacts to determine the significant environmental impacts.

2.0 SCOPE

Applicable to all activities, products and services of BHEL, Industrial systems group .

3.0 PROCEDURE DESCRIPTION

The task force, along with trained Environment auditors/experts, shall carry out survey, consultation with a cross section of employees, contractors and collect data on environment aspects & impacts related to all activities, product handling and services. The task force shall identify the areas of obvious physical improvement to strengthen environmental management system.

While identifying and evaluation of environmental aspects / impacts during initial environmental review the following criteria should be considered:

- All activities with previous records of Incidents /Accidents.
- Review of the normal, abnormal (including start-up/shutdown) and emergency operations;
- Review of existing environmental practices including methods of waste disposal;
- Inputs from regular site & MRC meetings.
- Evaluation of feedback from investigation of previous incidents/ accidents/ regulatory non-compliance;
- Views/feedbacks from internal & external interested parties (like employees, suppliers, customers, Government agencies) including any complaints;
- Occurrences of air pollution, water pollution, land contamination, resource loss, noise pollution;
- Any other environmental concern.
- Activities of all personnel having access to work place (including subcontractors & visitors).
- Facilities at the work places, whether provided by the organization or others.

Consider the following other conditions while identifying environmental aspects and impacts:

- **DIRECT:** Activities, which can be controlled by BHEL, ISG.
- **INDIRECT:** Activities where BHEL, ISG can have influence on its control.
- **NORMAL CONDITION:** Environmental Impact converted to tolerable/ non-significant condition & does not warrant any special preventive/protective provisions or measures.
- **ABNORMAL CONDITION:** Environmental Impact associated with identified aspect is beyond tolerance limit and does warrant specific use of preventive/protective provisions or

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measures.

- **EMERGENCY CONDITION:** Impacts, which are contained or mitigated by invoking emergency procedures related with potential foreseeable emergency situations

Prepare a consolidated list of Environmental Aspects and associated Impacts in the format no. HSEP: 02-F01.

Conduct site visits to verify the identified Environmental Aspects and associated Impacts & also the completeness in Format.

Based on the above prepare a list of activities of identified Environmental Aspects and associated Impacts, in the above format no. HSEP: 02-F01.

Criteria for Environmental assessment is developed through brain storming and discussion by task force with Co-opted members (if any) as per annexure 1 and as given below:

- a. **Legislative Concern (LC):** Any Environmental Aspects and associated Impacts covered in the identification of Environmental Aspects and associated Impacts by existing and applicable Environmental legislation and other notifications issued from time to time
- b. **Interested Party Concern (IPC) :** Any person / Dept./ Organization whether internal or external
- c. **Pollution Prevention (PP) , Resource Conservation**
- d. **Any Other :** like Chronic Effect (CE) - Any Environmental Aspects and Impacts leadings to medium and long term adverse Environment effects; Business Concern, etc
- e. **ScSeD** criteria

- **Sc** (Scale): Area of spread of environmental Impact
- **Se** (Severity) : Level of Environmental Damage, magnitude of harm
- **D** (Duration) : Time period during which environmental impact prevails:

The Environmental Evaluation Total (EET) shall be calculated for each environmental aspect as given in the format using ScSeD criteria.

EET = Sc +Se +D

This methodology of Environmental assessment provides for identification of Significant Aspects (refer Annexure 1).

Evaluate Environmental Aspects and associated Impacts as per above in the format and identify Significant Aspects.

While identifying Significant Aspects consideration shall be given to

- Air Pollution
- Water Pollution
- Land Contamination
- Noise Pollution

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- Resource Conservation / Depletion of Natural Resources
- Legal Compliance, Applicable legislation / Regulations
- Waste management
- Global Impacts
- Any other (PP, CE etc.) as relevant

Any environmental aspect falling under 'Over Riding Factors' shall be given special consideration while determining the control measures.

Any environmental aspects falling in to any category other than trivial and moderate shall be treated as significant aspect. ScSeD score may be used to prioritize amongst the significant aspect.

Any new / modified or changed environmental aspects/ Impacts in the existing projects/ regional office, introduction of new activity within the company, changes in the applicable legislation/ regulations shall be identified & informed by concerned site/Region to Head-Q, S&MM. The register of Environmental Aspects and Impacts for environmental assessment shall be reviewed and revised as per the procedure as and when required.

The latest information regarding applicable amendments in the existing regulations or introduction of new regulations shall be accessed through web sites of Ministry of Environment & forests, Ministry of Industry and Ministry of Labour, HSE publications / journals and relevant web sites.

While determining controls, or considering changes to existing controls, consideration shall be given to reducing the risks according to the following hierarchy:

- Elimination
- Substitution
- Reduction
- Recycling
- Control

The register of Environmental Aspects and Impacts is given in Annexure II.

The list of significant Environmental Aspects is given in Annexure III.

The feasibility analysis of significant Environmental Aspects to be done as per format no. HSEP: 02-F02 and is given in Annexure-IV.

4.0 DOCUMENT CONTROL

This document shall be issued and controlled as detailed in HSE Procedure HSEP: 02

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5.0 FORMATS USED

HSEP: 02 – F01 - Identification of Environmental Aspects/Impacts and evaluation/management/measures

HSEP: 02 – F02 - Feasibility Analysis of significant Environmental Aspects and Impacts.

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ANNEXURE- I

CRITERIA FOR ENVIRONMENTAL ASPECT IDENTIFICATION & IMPACT EVALUATION

Activity	Aspect			Impact	Evaluation					Significance	Management Measure
	Description	D/ I	N/ A/ E		Scale	Severity	Duration	Total	Over-riding Factors (LC / Any other)		
					Spot (1)	Insignificant / Minor (2)	Very Short <1 hour (1)			Trivial (4)	
					Within Dept. (2)	Moderate (4)	Moderate hour but < = 8 hours (2)			Moderate (5-8)	
					Outside Site (4)	Very High (8)	Continuous > 24 hours (4)			Intolerable (13-16)	

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Legend: Condition

D = Direct
I = Indirect
N = Normal
AN = Abnormal
E = Emergency

DETERMINING SEVERITY OF ENVIRONMENTAL IMPACTS – GUIDANCE CRITERIA

Level of Harm	Guidance Criteria
Insignificant / Minor	Momentary Discomfort / Does not require control
Moderate	May require control / mitigation
High	Control / mitigation certainly
Very High	• Sever ecological destruction • Severe Public health exposure / fatalities due to industrial activity • Irreversible despite control

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ANNEXURE – II

IDENTIFICATION OF ENVIRONMENTAL ASPECTS/IMPACTS AND EVALUATION / MANAGEMENT MEASURES

AI N	Activity	Aspect			Impact	Evaluation			Total (Sc + Se + d)	Over-riding Factors (LC/IPC/PP /ANY OTHER)	Significance	Management measures
		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
01.	Material Handling by Crane	a) Smoke due to vehicular exhaust	D/I	AN	Air Pollution	1	2	2	5		Moderate	OCP No. 25 for crane operation
		b) Noise from Engine	D/I	AN	Noise Pollution	2	2	2	6		Moderate	OCP No. 25
		c) Spillage of Diesel & Lube oil	D/I	N	Land Contamination	1	2	1	4		Trivial	OCP No. 25
02.	Material Handling (Manual)	Nil	I	-	-	-	-	-	-	-	-	
03.	Storage (approx. 5 nos. DA)/ Handling of Inflammable gas cylinders	a) Smoke due to fire	D/I	E	Air Pollution	2	4	1	7	PP	Moderate	OCP no. 05 & 10 for fire. Uses of Fire extinguishers
		b) Noise due to explosion	D/I	E	Noise Pollution	2	4	1	7		Moderate	OCP No. 05
04.	Storage of Lubrication Oil	a) Smoke due to fire	D/I	E	Air pollution	2	2	1	5	PP	Moderate	OCP no. 01 & 05
		b) Spillage and leakage	D/I	N	Land contamination	1	2	1	4		Trivial	OCP no. 01

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AI N	Activity	Aspect			Impact	Evaluation			Total (Sc + Se + d)	Over-riding Factors (LC/IPC/PP /ANY OTHER)	Significance	Management measures
		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
05.	Working at Night	Nil	-	-	-	-	-	-	-	-	-	-
06.	Computer Operation	Disposal of empty cartridges	D	N	Land Contamination	1	2	1	4		Trivial	OCP No. 27 for waste disposal
07.	Storage in open yard(Customer)	a) Waste material	D/I	N	Land contamination	1	2	2	5		Moderate	OCP No. 27 for waste disposal
08	Welding	Fire	I	E	Air Pollution	2	4	1	7		Moderate	OCP No.04 & 05 for welding /Fire safety
		Improper Disposal of Metal Waste	I	AN	Land contamination	2	2	2	6		Moderate	OCP No. 27 for disposal of waste
		Improper Disposal of Welding Rod Bits	I	AN	Land contamination	2	2	2	6		Moderate	OCP No. 27 for disposal of waste
		Emission of Fumes	I	AN	Air Pollution	1	2	2	5		Moderate	Existing practice to continue OCP No. 11
09	Gas Cutting	Fire	I	E	Air Pollution	1	3	1	5	DC	Moderate	OCP for safe welding and gas cutting OCP No. 04 & 05
		Improper Disposal of Metal Waste	I	AN	Land Contamination	1	2	4	7		Moderate	OCP No. 27
		Leakage of Combustible Gas	I	AN	Air Pollution	1	2	2	5		Moderate	OCP No. 04
			I	AN	Depletion of Natural Resources	1	2	1	4		Trivial	OCP No. 04

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AI N	Activity	Aspect			Impact	Evaluation			Total (Sc + Se + d)	Over-riding Factors (LC/IPC/PP /ANY OTHER)	Significance	Management measures
		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
10.	Tube Bending Operation	Spillage and leakage of Hydraulic oil	I	AN	Depletion of natural resources	1	2	1	4		Trivial	Existing practice to continue
		Improper cleaning of spilled oil	I	AN	Land contamination	1	2	1	4		Trivial	Existing practice to continue
11.	Drilling and Reaming	Improper Disposal of Metal Chips	I	AN	Land Contamination	2	2	1	5		Moderate	OCP No. 27 & 32
			I	AN	Land Nuisance	1	2	1	4		Trivial	OCP No. 27 & 32
		Noise Generation	I	AN	Noise Pollution	1	2	1	4		Trivial	Existing practice to continue OCP No. 32
12.	Scraping	Waste generation	I	N	Land Pollution	1	4	1	6		Moderate	OCP No. 27
13.	Grinding	Scattering of metal chips	I	N	Land Nuisance	1	2	1	4		Trivial	OCP No. 32
14.	Radiography	Spillage / Leakage of Chemicals	I	AN	Land Contamination	1	4	1	6		Moderate	OCP No. 26 & 27
		Improper Disposal of Chemical Waste	I	AN	Water Pollution	1	4	1	6		Moderate	OCP No. 27
15.	Dye Penetrant Test	Spillage / leakage of chemicals	I	AN	Land Contamination	1	2	1	4		Trivial	OCP No. 27
			I	AN	Water Pollution	1	2	1	4		Trivial	OCP No. 27
		Fire / Explosion	I	AN/E	Air Pollution	1	2	1	4		Trivial	OCP No.05 for fire safety

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
16.	Working at Height	Nil	-	-	-	-	-	-	-		-	
17.	Lifting/Alignment of heavy material	a) Smoke due to vehicular exhaust	D/I	AN	Air Pollution	1	2	2	5		Moderate	OCP No. 09
		b) Noise from Engine	D/I	AN	Noise Pollution	1	2	2	5		Moderate	OCP No. 09
18.	Working Inside Servicing Area	Spillage of Lubricants, Grease etc.	D/I	N	Land Contamination	1	2	2	5		Moderate	OCP No. 23
19.	Hydraulic Test	Nil	-	-	-	-	-	-	-		-	
20.	Spillage of diesel and lubricants from storage yard.	a) Spillage of Lube Oil	D/I	N	Land Contamination	1	2	2	5		Moderate	OCP No. 20 & 13
		b) Smoke due to potential Fire	D/I	E	Air Pollution	2	4	1	7		Moderate	OCP no. 05 ,20 & 07. Uses of Fire extinguishers
21.	Trial run of Rotary Equipment	a) Noise of rotary parts	D/I	N	Noise Pollution	1	2	2	5		Moderate	OCP No. 35
		b) Leakage of bearing oil	D/I	N	Land Contamination	1	2	2	5		Moderate	OCP No. 35

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
22.	Milestone Activity	Nil	-	-	-	-	-	-	-		-	
23.	Commissioning of Electrical panel	Smoke due to fire	D/I	E	Air Pollution	1	4	1	6		Moderate	OCP No.02
24.	Excavation/ Reinf orcement /Erectio n of Scaffoldings	Dust Emission > Std.	I	AN	Air Pollution	1	2	1	4		Trivial	Dust suppression/water spray
		Noise Generation (> Std.)	I	AN	Noise Pollution	1	2	1	4		Trivial	Ear plugs to be used
		Improper Disposal of Metal Waste	I	AN	Land Contamination/Nuisa nce	1	2	3	6		Moderate	OCP No. 27
25.	Excavation by Blasting	Emission of Blast Fumes	I	AN	Air Pollution	1	2	1	4		Trivial	OCP No 46
			I	AN	Air Pollution With Increase in SPM	3	4	1	8		Moderate	OCP No 46
		Noise Generation (> Std.)	I	AN	Noise Pollution	1	4	1	6	LC Rule 03 The Noise pollution Rule ,2003	Moderate	OCP No 46 Use of earplug. Cordoning of area
26.	Batching	Spillage of Mortar	I	AN	Land Contamination	1	2	1	4		Trivial	OCP No 36
			I	AN	Land Nuisance	1	2	1	4		Trivial	OCP No 36
		Emission of Cement Dust > Std.	I	AN	Air Pollution	1	4	2	7	CE	Moderate	OCP No 36
		Over Consumption of Energy	I	AN	Depletion of Natural Resources	1	2	1	4		Trivial	OCP No 03
		Noise Generation (> Std.)	I	AN	Noise Pollution	1	2	3	6		Moderate	

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
27.	Glass Work	Improper Disposal of Glass Waste	I	AN	Land Contamination/land nuisance	1	2	1	4		Trivial	OCP No. 27
28.	Dewatering	Over Consumption of Energy	I	AN	Depletion of Natural Resources	1	2	1	4		Trivial	OCP No. 03
		Noise Generation (> Std.)	I	AN	Noise Pollution	1	2	1	4		Trivial	Existing practice to be continued.
29	Roof Slabs Fixing	Nil	-	-	-	-	-	-	-	-	-	-
30.	Painting	Spillage and leakage of Paints	I	AN	Land Contamination	1	2	1	4		Trivial	Existing practice to be continued.
		Emission of Paint Fumes	I	N	Air Pollution	1	2	4	7		Moderate	Existing practice to be continued.
		Improper Disposal of Paint Containers	I	AN	Land Contamination	2	4	1	7	LC Rule 8 Hazardous Waste Rule, 1989.	Moderate	OCP No. 27
31.	Cable Laying / Tray Work	Improper Disposal of Cable Waste	I	AN	Land Contamination	1	2	1	4	LC Rule 4 Hazardous Waste Rule, 1989.	Trivial	OCP No. 27
		Improper Disposal of Metal Waste	I	AN	Land Contamination	1	2	4	7		Moderate	OCP No. 27
			I	AN	Depletion of Natural Resources	1	2	2	5		Moderate	OCP No. 27
32.	Transformer Charging	Fire	I	AN/E	Air Pollution	1	4	1	6		Moderate	OCP No. 02 & 47
		Spillage and leakage of transformer oil	I	AN	Land Contamination	1	4	1	6	PP	Moderate	OCP No. 47

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
33.	Electrical Commissioning	Nil	-	-	-	-	-	-	-		-	-
34.	Battery Systems	Spillage of Acid	I	AN	Land Contamination	1	2	1	4	.	Trivial	OCP No. 01 & 48.
		Improper Disposal of Maintenance Waste	I	AN	Land Contamination	1	2	1	4	LC Rule 8 Hazardous Waste Rule, 1989.	Trivial	OCP No. 27 & 48.
		Emission of Acid Fumes	I	N	Air Pollution	1	2	2	5		Moderate	OCP No. 27 & 48.
		Improper Disposal of Waste Battery	I	AN	Land Contamination/	1	4	1	6	LC Rule10, The Batteries Rules 2001.	Moderate	OCP No. 27 & 48.
35.	Battery Systems	Battery Explosion	I	AN/E	Land Contamination	2	2	1	5		Moderate	OCP No. 27 & 48
			I	AN	Air Pollution	2	4	1	7		Moderate	Existing practice to be continued. OCP No. 27 & 48.
36.	Spray Insulation	Spillage of Insulation Dust	I	N	Air Pollution	1	6	1	8		Moderate	OCP No. 38
		Improper Disposal of Insulation Waste	I	AN	Land Contamination	2	2	4	8		Moderate	OCP No. 27 & 38
37.	Mineral Wool Insulation	a) Mineral Wool dust	I	N	Air Pollution	2	2	2	6		Moderate	OCP No.28
		b) Waste generation	I	N	Land Contamination	1	2	2	5		Moderate	OCP No. 27 & 28

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
38.	Chemical Cleaning/ Handling	Spillage of chemicals	I	AN	Land Contamination	1	2	2	5	PP	Moderate	OCP No. 01 &19
			I	AN	Air Pollution	1	2	2	5		Moderate	OCP No. 01 &19
		Improper Disposal of Chemical Containers	I	AN	Land Nuisance/ Contamination	1	6	1	8	LC Rule 8 Hazardous Waste Rule, 1989.	Moderate	OCP No. 27
			I	AN	Water Pollution	1	4	1	6		Moderate	OCP No. 27
39.	Chemical Cleaning/ Handling	Improper disposal of spent chemicals	I	AN	Water Pollution	2	6	1	9	LC Rule 03, The environment al Rules 1989.	Substantial	OCP No. 27
			I	AN	Land Contamination	1	4	1	6	LC Rule 03, The environment al Rules 1989.	Moderate	OCP No. 27
40.	Compressor Operation	Spillage of Oil and Fuel	I	AN	Land Contamination	1	2	4	7		Moderate	OCP No. 39
		Over Consumption of Oil and Fuel	I	AN	Depletion of Natural Resources	1	2	4	7		Moderate	OCP No. 39
		Noise Generation	I	N	Noise Pollution	3	4	1	8		Moderate	OCP No. 39
41.	DG Set Operation	Spillage of Oil and Fuel	I	AN	Land Contamination	1	4	1	6		Moderate	OCP No. 49
			I	AN	Air Pollution	1	2	1	4		Trivial	OCP No. 49
		Emission of Exhaust Fumes	I	N	Air Pollution	1	4	2	7		Moderate	OCP No. 49
42.	DG Set Operation	Noise Generation	I	N	Noise Pollution	3	4	1	8	LC Rule 03, The Noise pollution Rules, 2000.	Moderate	OCP No. 49 and ear plug to be used.

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
43.	Operation of central AC plants	a) Noise	D/I	N	Noise Pollution	2	2	3	7		Moderate	OCP No. 43
		b) Leakage of Refrigerant	D/I	AN	Air Pollution	3	2	3	8		Moderate	OCP No. 43
44.	Safety Valve Floating	Over Consumption of Energy	D	AN	Depletion of Natural Resources	1	4	1	6		Moderate	Existing practice to be continued.
		Over Consumption of Water	D	AN	Depletion of Natural Resources	1	4	1	6		Moderate	Existing practice to be continued.
		Noise Generation (> Std)	D	AN	Noise Pollution	1	4	1	6		Moderate	Existing practice to be continued.
45.	Lighting maintenance	Nil	-	-	-	-	-	-	-	-	-	-
46.	Electrical Maintenance (220 V)	Disposal of Electrical Waste	I	N	Land Contamination	2	2	2	6	PP	Moderate	OCP No.27 & 42.
47.	Electrical Maintenance (440 V)	Disposal of Electrical Waste	I	N	Land Contamination	2	2	2	6	PP	Moderate	OCP No. 27 & 42.

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
48.	Working at height	Nil	D/I	-	-	-	-	-	-	-	-	-
49	Overhead Tank Maintenance	Nil	D/I	-	-	-	-	-	-	-	-	-
50.	Roof and Wall repair	a) Waste generation	I	N	Land Nuisance	1	2	2	5		Moderate	OCP No. 27
		b) Noise due to tools	I	N	Noise Pollution	2	2	2	6		Moderate	Existing practice to be continued.
51.	Cleaning of floors	a) Uses of chemicals like Phenols, detergents etc.	I	N	Land Contamination/ Water Pollution	2	2	1	5		Moderate	OCP No. 01
		b) Over consumption of water	I	AN	Depletion of natural resources	2	1	2	5		Moderate	Existing practice to continue
52.	Arc welding, Gas cutting of grills, railings etc.	a) Fire/Explosion	I	E	Air Pollution/Noise Pollution	2	4	1	7		Moderate	OCP No. 05 & 11
		b) Emission of Gases/Fumes	I	N	Air Pollution	1	2	2	5		Moderate	OCP No. 11
		c) Waste material	I	N	Land Contamination	1	2	2	5		Moderate	OCP No. 27
53.	Sanitary maintenance	Spillage and leakage of Effluents	D	AN	Water Pollution	2	4	2	8		Moderate	OCP No. 50
54.	Maintenance of Air conditioning system	Leakage of Refrigerants (Freon Etc.)	I	AN	Ozone Depletion	1	6	1	8	LC Rule 04, The Manufacture , storage and import of hazardous chemicals Rule, 1989.	Moderate	OCP No. 43

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
55.	Office upkeep for emergency prevention/ management	Nil	-	-	-	-	-	-	-		-	-
56.	Fire Management	Smoke	D/I	E	Air Pollution	4	1	2	7	-	Moderate	OCP No. 05
57.	Food Preparation	Generation of Food Waste	D	N	Water Pollution	2	4	1	7		Moderate	OCP No. 27
			D/I	N	Land Nuisance	2	4	1	7		Moderate	OCP No. 27
			I	N	Depletion of Natural Resources	1	2	2	5		Moderate	Existing practice to continue
		Over Consumption of Electricity	D	AN	Depletion of Natural Resources	2	2	4	8		Moderate	OCP No. 03
		Over Consumption of water	D	AN	Depletion of Natural Resources	1	2	4	7		Moderate	Existing practice to continue
		Spillage and leakage of cooking oil	D	AN	Depletion of Natural Resources	1	2	4	7		Moderate	-do-
			D	AN	Land Nuisance	1	2	4	7		Moderate	-do-
58	Cleaning of cement containers after RMC.	Generation of Domestic Effluent	I	N	Water Pollution	1	2	4	7		Moderate	OCP No. 27&36
		Generation of concrete Waste	I	N	Land Nuisance	1	2	4	7		Moderate	OCP No. 27 & 36.
59.	Driving of vehicles	a) Vehicular Exhaust	D/I	N	Air Pollution	2	2	2	6	LC, Rule 112, 115, 116 Motor Vehicles	Moderate	OCP No. 25
		b) Spillage of lube oil, fuel etc.	D/I	N	Land Pollution	1	2	2	5		Moderate	OCP No. 25
60.	Brazing	a) Emission of fumes(Acids, Solvents etc.)	I	N	Air Pollution	1	2	4	7		Moderate	OCP No. 04

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
61.	Handling and Storage of Packaging material	a) Improper Disposal of Packaging Material	I	AN	Land Contamination	2	2	4	8		Moderate	OCP No. 27
		b) Smoke due to fire from wooden materials	D/I	AN/E	Air pollution	2	4	1	7	DC	Moderate	OCP No. 05
62.	Material Preservation	a) Spillage of Paints	I	AN	Land Contamination	1	2	2	5		Moderate	Existing practice to continue
		b) Spillage of Preservatives	I	AN	Land Contamination	1	2	2	5		Moderate	Existing practice to continue
		c) Improper Disposal of Plastic Waste	I	AN	Land Contamination	2	4	4	10		Substantial	OCP No. 27
63.	General Office Work	Consumption of Paper	D	AN	Depletion Of Natural Resources	1	2	2	5		Moderate	Existing practice to continue
		Improper Disposal of Plastic Waste	D	AN	Land Contamination	1	4	1	6		Moderate	OCP No. 27
64.	Usage of Water	a) Over Consumption	D	AN	Depletion of Natural Resources	1	2	2	5		Moderate	Existing practice to be continued
		b) Spillage/Leakage of Water	D/I	AN	Depletion of Natural Resources	1	2	2	5		Moderate	Existing practice to be continued
65.	Usage of Electrical Appliances (Fridge, AC Etc.)	Fire	D	E	Air Pollution	2	4	2	8		Moderate	OCP No. 05 & 43
		Over Consumption of Energy	D	AN	Depletion of Natural Resources	1	4	4	9		Substantial	OCP No. 43
		Leakage of Refrigerants (Freon etc.)	I	AN	Ozone Depletion - Environmental Hazard	2	4	1	7	PP	Moderate	OCP No. 43
			I	AN	Depletion of Natural Resources	1	4	1	6		Moderate	-do-

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
66.	Handling and Storage of Chemicals	a) Spillage of Oil and Fuel	I	AN/E	Land Contamination	1	4	1	6		Moderate	OCP No. 1
			I	AN/E	Air Pollution	1	2	1	4	PP	Trivial	OCP No.01.
			I	AN	Water Pollution	2	4	1	7		Moderate	OCP No.01
		b) Emission of Fumes (Acids, Solvents etc.)	I	N	Air Pollution	1	2	1	4		Trivial	OCP No. 01
		c) Spillage / Leakage of Chemicals	I	AN	Land Contamination	2	6	2	10		Substantial	OCP No. 01.
			I	AN	Water Pollution	2	4	2	8		Moderate	-do-
			I	AN	Air Pollution	1	2	2	5		Moderate	Existing practice to continue
	HEMM / Crane Operations	Spillage of Oil and Fuel	I	AN	Land Contamination	1	2	1	4		Trivial	OCP No. 09 & 25.
		Vehicular Exhaust Emission	D/I	N	Air Pollution	1	2	2	5	PP	Moderate	-do-
		Over Consumption of Oil And Fuel	I	AN	Depletion of Natural Resources	1	2	2	5		Moderate	-do-

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
68.	Usage of DG set by sub contactor	a) Spillage of Oil and Fuel	I	AN	Land Contamination	1	2	2	5		Moderate	OCP No. 20 & 13.
		b) Over Consumption of Oil and Fuel	I	AN	Depletion of Natural Resources	1	2	2	5		Moderate	OCP No. 13.
		c) Noise Generation (> Std)	I	AN	Noise Pollution	1	2	2	5	LC Rule 03, The Noise Pollution Rule, 2000.	Moderate	OCP No. 49.
		d) Spillage of lubricating grease, engine oil,diesel.	I	AN	Land contamination	1	2	1	4		Trivial	OCP No. 20 & 13.
		e) Over consumption of Electricity	I	AN	Depletion of Natural Resources	1	2	2	5		Moderate	OCP No. 03
69.	Grouting	Spillage of Mortar	I	N	Land Contamination	1	2	1	4		Trivial	Existing practice to be continued.
70.	Concrete / Mortar Mixing	Spillage of Mortar	I	AN	Land Contamination	1	2	1	4		Trivial	Existing practice to be continued.
			I	AN	Land Nuisance	1	2	1	4		Trivial	Existing practice to be continued.
		Emission of Cement Dust > Std	I	AN	Air Pollution	2	2	1	5	CE	Moderate	PPE, mask to be used
71.	Concreting	Spillage of Mortar	I	N	Land Contamination/ Land Nuisance	1	2	1	4		Trivial	Existing practice to be used.
		Noise Generation (> Std)	D/I	AN	Noise Pollution	1	2	1	4		Trivial	PPE, ear plug to be used
72.	Stacking and Removal of Overburden	a) Dust Emission > Std	I	N	Air Pollution with increase in SPM	2	2	1	5		Moderate	Existing practice to be continued.
		b) Noise Generation (> Std)	I	AN	Noise Pollution	1	2	1	4		Trivial	Existing practice to be continued.

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
73.	Handling and Storage of Cement	Emission of Cement Dust > Std	I	N	Land Contamination	2	2	2	6		Moderate	OCP No. 01
			I	N	Air Pollution With Increase In SPM	2	4	2	8		Moderate	OCP No. 01
74.	Carpentry	a) Emission of Saw Dust	I	N	Air Pollution- Increase In SPM/ RSPM	1	4	1	6	CE	Moderate	-do-
		b) Fire	I	AN	Air Pollution	2	4	1	7		Moderate	Fire Extinguisher to me made available and OCP No. 05
75.	Pile Driving	Dust Emission	I	N	Air Pollution	1	2	1	4		Trivial	OCP No. 51
			I	AN	Air Pollution With Increase In SPM	2	4	1	7		Moderate	OCP No. 51
		Noise Generation (> Std.)	D/I	AN	Noise Pollution	1	2	1	4		Trivial	PPE to be provided
76.	Concrete Vibrator Operation	a) Noise Generation (> Std.)	D/I	AN	Noise Pollution	1	2	1	4		Trivial	PPE to be provided
		b) Over Consumption of Electricity	I	AN	Depletion of natural resources	1	2	1	4		Trivial	OCP No. 02
77.	Operation of HEMM	a) Dust Emissions	I	N	Air Pollution	1	2	2	5		Moderate	PPE to be provided.
		b) Generation of Noise	I	N	Noise Pollution	1	2	2	5		Moderate	PPE to be provided and OCP No. 09.

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
78.	Earth Filling Operations	Dust Emissions	I	N	Air Pollution	2	2	1	5		Moderate	OCP No.09
79.	Oil Flushing	Spillage of Oil and Fuel	I	AN	Land Contamination	1	2	1	4		Trivial	Existing practice to be continued.
			I	AN	Depletion Of Natural Resources	1	2	1	4		Trivial	Existing practice to be continued.
			I	AN	Water Pollution	1	2	1	4		Trivial	Existing practice to be continued.
80.	Removal of Oil After Flushing	a) Spillage of Oil and Fuel	I	AN	Land Contamination	1	2	1	4		Trivial	OCP No. 20 & 27.
			I	AN	Depletion Of Natural Resources	1	2	1	4		Trivial	OCP No. 20 & 27.
			I	AN	Water Pollution	1	2	1	4		Trivial	OCP No. 20 & 27.
		b) Disposal of Waste Oil	I	AN	Land Contamination	1	2	1	4		Trivial	OCP No. 27
			I	AN	Water Pollution	2	2	1	5		Moderate	OCP No. 27
81.	Oil Filtration	Spillage of Oil and Fuel	I	AN	Land Contamination	1	2	1	4		Trivial	OCP No. 20 & 27.
			I	AN	Water Pollution	1	2	1	4		Trivial	-do-

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
82.	Handling and Storage of Oil	Spillage of Oil and Fuel	D/I	AN	Land Contamination	1	2	1	4	LC Rule 4, The manufacture, storage and import of hazardous chemical rules, 1989.	Trivial	EHMS for leakage spilling of oil
			D/I	AN	Water Pollution	1	2	1	4		Trivial	-do-
		Fire	D/I	AN/E	Air Pollution	3	6	3	12		Substantial	OCP No. 01
83.	Steam Dumping	Noise Generation (> Std)	D	AN	Noise Pollution	1	2	2	5		Moderate	Ear plug to be Used
84.	Alkali Boil out	a) Spillage of Alkali	D/I	AN	Land Contamination	1	2	2	5		Moderate	OCP No. 21
		b) Improper Disposal of Chemical Containers / bags	D/I	AN	Land Contamination	2	4	1	7	LC Rule 8, hazardous wastes rule 1989.	Moderate	OCP No. 21
		c) Over Consumption of Energy	D/I	AN	Depletion of Natural Resources	2	2	2	6		Moderate	OCP No. 21
		d) Consumption of Water	D/I	N	Depletion of Natural Resources	2	2	2	6		Moderate	OCP No. 21
		e) Disposal of Balance Alkali	D/I	AN	Land Contamination	2	6	1	9		Substantial	EHMS for neutralization and OCP No. 21.
			D/I	AN	Water Pollution	1	6	1	8		Moderate	OCP No. 21

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
85.	Acid Cleaning	Spillage of Acid	D/I	AN	Land Contamination	1	6	1	8		Moderate	OCP No. 19
		Improper Disposal of Acid Containers	D/I	AN	Land Contamination	1	6	1	8		Moderate	OCP No. 19 & 27
		Over Consumption of Energy	D/I	AN	Depletion of Natural Resources	2	4	2	8		Moderate	OCP No. 19
		Consumption of Water	D/I	N	Depletion of Natural Resources	2	2	4	8		Moderate	OCP No. 19
		Disposal of Balance Acid	D/I	AN	Land Contamination	1	6	2	9	LC Rule 8, Hazardous wastes rule, 1989.	Substantial	OCP No. 19 & 27.
					Water Pollution	4	4	1	9		Substantial	
86.	Usage Of Electrical Appliances	a) Fire	D	AN	Air Pollution	2	4	1	8		Moderate	OCP No. 05
		b) Over Consumption of Energy	D	N	Depletion of Natural Resources	1	2	1	4		Trivial	OCP No. 02
87.	Photo Copying	Disposal of Empty Cartridge	D	N	Land Contamination	1	4	1	6		Moderate	OCP No. 27
88.	Cleaning of Canteen	Generation of Domestic Effluent	D	N	Water Pollution	1	2	1	4		Trivial	Existing practice to continue
89.	Storage of Food items	Leakage and spillage	D / I	AN	Land Nuisance	1	2	4	7		Moderate	do
		Fire	D	E	Environmental Hazard	1	4	1	6		Moderate	OCP for fire safety

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		Description	D/I	N/AN/E		Scale (Sc)	Severity (Se)	Duration (d)				
90.	Lift / Cage Operations	-	-	-	-	-	-	-	-	-	-	-
91.	Fabrication work	Generation of metal scrap	D	N	Resource loss	3	2	3	8		Moderate	Ensure optimum use of resource as per drg.100
92	Vibrator Operation	Noise Generation	D/I	N	Noise Pollution	1	2	1	4		Trivial	Maintenance of machine
93	Short Blasting	Dust Emission	I	N	Air Pollution	1	4	2	7		Moderate	Ensure operation is done in closed shed
94	EDTA Cleaning	-	-	-	-	-	-	-	-		-	-

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ANNEXURE – III

LIST OF SIGNIFICANT ENVIRONMENTAL ASPECTS

SL NO.	ACTIVITY	SIGNIFICANT ASPECT
1	Chemical Cleaning/ Handling	Improper disposal of spent chemicals causing water pollution
2	Material Preservation	Improper Disposal of Plastic Waste causing land contamination
3	Usage of Electrical Appliances (Fridge, AC Etc.)	Over Consumption of Energy
4	Handling and Storage of Chemicals	Spillage / Leakage of Chemicals causing land contamination
5	Handling and Storage of Oil	Fire
6	Lead-acid Battery Disposal	Disposal of battery causing land contamination

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ANNEXURE – IV

FEASIBILITY ANALYSIS OF SIGNIFICANT ENVIRONMENTAL ASPECTS

Sl. No	Activity / product / Service	Significant Aspect	Associated Impact	Measures Required to				Operational Feasibility	Economic Viability	Elimination / Reduction / Control	Ref. Doc
				Eliminate or Reduce			Control				
				Technology	Physical Improvements	Feasibility Study	Technique / Training				
1	Chemical Cleaning/ Handling	Improper disposal of spent chemicals	Water pollution	Development and use of Eco-friendly chemical for cleaning (EDTA)	Construction of Neutralization pit	-	Training on chemical storage and handling	Yes	Yes	Control	MSDS Procedure for Handling and storage of chemicals
2	Material Preservation	Improper Disposal of Plastic Waste	Land contamination	Construction of Scrap Yard	Segregation of waste at source by provision of different bins	-	-	Yes	Yes	Control	OCP No. 27
3	Usage of Electrical Appliances (Fridge, AC	Over Consumption of Energy	Depletion of Natural resources	Use of energy efficient appliances.	Regular maintenance	-	Awareness for optimum use	Yes	Yes	Reduction / Control	OCP No. 03 & 43

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Sl. No	Activity / product / Service	Significant Aspect	Associated Impact	Measures Required to				Operational Feasibility	Economic Viability	Elimination / Reduction / Control	Ref. Doc
				Eliminate or Reduce			Control				
				Technology	Physical Improvements	Feasibility Study	Technique / Training				
4	Handling and Storage of Chemicals	Spillage / Leakage of Chemicals	Land contamination	-	Introduction of “bund” in storage area as secondary containment	-	Procedure for Handling and storage of chemicals	Yes	Yes	Reduction / Control	OCP No. 01 MSDS
5	Handling and Storage of Oil	Fire	Airpollution	-	Introduction of flame proof electrical fittings.	-	Use of MSDS	Yes	Yes	Control	MSDS OCP No. 05
6	Lead-acid Battery	Lead-acid Battery Disposal	Land contamination	Development and use of Eco-friendly chemical for cleaning (EDTA)	Construction of Neutralization pit	-	-	Yes	Yes	Elimination/Control	EDTA Chemical Cleaning Procedure. OCP No. 19 & 27

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FORMAT - I

IDENTIFICATION OF OHS HAZARDS AND RISK / RISK ASSESSMENT / RISK MANAGEMENT MEASURE

RISK IDENTIFICATION										RISK ASSESSMENT					Over riding factors (LC / DC/ Any Other)	Risk Control Measures
AI N	Activity	Hazard	Condition			Adequacy Measure		Risk		Scal e (Sc)	Severity (Se = LXC)		Total (Sc+ Se)	Risk Classificati on		
			D/I	R/ NR	N / AN / E	Existing	Gaps, if any	Likelihood	Consequence		Likeli- hood (L)	Level of Conse quence (C)				

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FORMAT - II

FEASIBILITY ANALYSIS OF NON-TOLERABLE OHS HAZARDS & RISKS

Sl. No	Activity / product / Service	OHS Hazard	Non-Tolerable OHS risk	Hazard Management Measures Required to				Operational Feasibility	Economic Viability	Elimination / Reduction / Control	Ref. Doc
				Eliminate or Reduce			Control				
				Technology	Physical Improvements	Feasibility Study	Technique / Training				

Technology

- Whether new technology or modification in the present technology required

Physical improvement

- Whether new physical construction or modification in the present physical condition required

Feasibility study

- Whether feasibility study is required to identify the possible solution

Operational feasibility

- Whether proposed measure shall be operationally feasible

Economic viability

- Whether proposed measure shall be economical viable

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All	00	New HSEMS for INDUSTRIAL SYSTEMS GROUP	XXXXX

Prepared by: Internal Auditor

Approved and issued by : R K OJHA

