

**GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT & FORESTS  
PARYAVARAN BHAWAN, CGO COMPLEX,  
LODHI RAOD, NEW DELHI-110003**

**EXPRESSION OF INTEREST (EOI)**

The Ministry of Environment and Forests invites Techno-financial Bids from consulting firms/ organizations/ institutions/ consortiums which have required expertise and experience in the relevant fields to undertake the preparation of “Hazard Analysis Reports and Off-site Emergency Plans as per the Schedule 12 of the MSIHC Rules, 1989 (amended in 2000)” for 41 districts.

The detailed EOI notice is posted on the website of MoEF:<http://moef.nic.in/modules/tenders-and-advertisement/advertisements>.

Mere submission of EOI will not confer to applicants any right for receiving or carrying out the tendered job. MOEF reserves the right to accept/reject one or all EOIs or stop the process of approval at any stage, at its sole discretion without assigning any reasons and shall bear no liability whatsoever consequent upon such a decision.

The EOI shall be submitted in a sealed envelope through Speed Post, Registered Post or delivered by hand super scribing **“Preparation of Hazard Analysis Reports and Off-site Emergency Plans District Name”** on top of the envelope to the following address. The submission shall be made within 21 days from the date of publication of the advertisement in the newspaper. Duration of the study – one year (or) twelve months for the Off-site Emergency Plan including Hazard Analysis Report.

**Address:**

**Dr.Chhanda Chowdhury**

**Director, Hazardous Substances Management Division**

**Ministry of Environment and Forests**

**Room No. 741 Paryavaran Bhawan**

**CGO Complex, Lodhi Road, New Delhi-110003**

**Phone: 011-24360662/24362875**

**List of Districts for preparation of “Hazardous Analysis Report and Off-site  
Emergency Plans”**

The Ministry of Environment and Forests invites Techno-financial Bids to undertake preparation of “Hazard Analysis Reports and Off-site Emergency Plans as per the Schedule 12 of the MSIHC Rules, 1989 (amended in 2000)” for the following districts.

<b>Name of the State</b>	<b>S.No.</b>	<b>Districts</b>	<b>No of MAH units</b>
Andaman & Nicobar Island	1.	Andaman	3
Andhra Pradesh	2.	Ananthapur	4
	3.	Karim Nagar	2
	4.	Vizianagaram	2
Bihar	5.	Patna	4
	6.	Begusarai	8
Himachal Pradesh	7.	Solan	3
	8.	Sirmour	3
Jharkhand	9.	East Singhbhum	4
	10.	Saraikala Kharsawa	3
	11.	Bokaro	3
Haryana	12.	Gurgaon	10
	13.	Faridabad	8
	14.	Panipat	7
	15.	Rewari	7
	16.	Hisar	6
	17.	Jhajjar	5
	18.	Rohtak	4
West Bengal	19.	24 Pargana (North)	9
	20.	Hoogly	9
	21.	Kolkata	8
	22.	N. Japaiguri	6
	23.	Howrah	5
Uttrakhand	24.	Haridwar	10
	25.	Nainital	3

Name of the State	S.No.	Districts	No of MAH units
Tamil Nadu	26.	Kancheepuram	17
	27.	Coimbotore	7
	28.	Krishnagiri	6
	29.	Vellore	4
	30.	Trichy	5
	31.	Nagapattnam	4
	32.	Erode	3
Rajasthan	33.	Sirohi	4
	34.	Udaipur	4
	35.	Jodhpur	6
	36.	Bikaner	4
	37.	Bharatpur	2
Orissa	38.	Dhenkanal	2
	39.	Jajpur	2
	40.	Khurda	3
Karnataka	41.	Ramanagaram	4

## **TERMS OF REFERENCE FOR HAZARD ANALYSIS AND RAPID SAFETY**

### **AUDIT**

The scope of the consultants under the contract will be to carry out hazard analysis of Major Accident Hazard (MAH) units in selected industrial pockets, develop risk minimization plans for the units and the area and generate vulnerability information. The study will involve:

1. A Rapid Safety Audit of all the MAH units in the area to derive the following information:
  - a) Management and safety systems in place;
  - b) Compliance to various regulations;
  - c) Potential hazardous areas in the facility;
  - d) On-site emergency plans and preparedness;
  - e) Standards of operation and maintenance;
  - f) Status of training program;
2. Hazard analysis of the MAH units based on information obtained during the rapid safety audit including:
  - a) Identification of hazards in the facility, both process, storage, location of storage and conditions and quantities stored.
  - b) Identify the possible failure mode and delineate vulnerable zones.
  - c) Consequence Analysis.
3. Relevant information regarding physico-chemical properties and their effects on human, animal and the eco-system considered, to be tabulated.
4. Suggest risk reduction measures and strategy in the facility and the area.
5. Plot the vulnerable zones for select chemicals for the unit and the area.
6. Provide vulnerability templates along with Map to (1:50000) scale. The templates shall indicate damage distance, plume foot print and response time.
7. Population likely to be affected under each scenario, for which consequence modeling has been carried out, should be reported based on the latest census data
8. Material Safety Data Sheets for all the chemicals covered in the study needs to be included in the Hazard Analysis Report
9. Work out methodology for the study and discuss the same with the MoEF.

10. Following types of outputs are expected of the consultant.
  - (a) Written Reports:
    - (i) Rapid Safety Audit report for all the occupiers and 7 copies each of the report for the ministry compiled as one volume
    - (ii) A simple Hazard Analysis report of the industrial pocket for the District Collector, and
    - (iii) Detailed Hazard Analysis report for the Ministry - 7 copies (final).
  - (b) A simple first response guide with templates and vulnerable zone curves to scale, for the use of the Collector.
  - (c) A computerized information database on a format (to be provided by the Ministry), for the industrial pocket, on floppies, for the Ministry.
  - (d) Self contained summary of the study needs to be provided to Ministry and all Core Group Members along with the reports.
  - (e) Summary containing major risk mitigation measures/ recommendations shall be prepared unit wise based on the Hazard Analysis & Rapid Safety Audit study findings and submitted to the Ministry for further follow up along with the report
11. All MAH units in the area as designated under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, are to be covered, irrespective of the number of the MAH units cited by the consultant in his quotation or any other agency.
12. All MAH installations within the port areas and covered under the Dock Workers (Safety, Health and Welfare) Act, 1986 shall also be covered as part of the study.
13. During the Rapid Safety Audit (RSA) of Petroleum & LPG Bottling installations compliance with respect to Oil Industry Safety Directorate (OISD) standards need to be assessed.
14. As part of the Rapid Safety Audit, compliance with respect to following acts/rules need to be assessed:
  - (a) The Manufacture, Storage and import of Hazardous Chemical Rules, 1989 amended 2000
  - (b) The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996

- (c) Public Liability Insurance Act, 1991, amended 1992 and the Public Liability Insurance Rules, 1991, amended 1993
  - (d) Explosive Act, 1884 and Explosive Rules, 1983, Gas Cylinder Rules, 2004 and Static and Mobile Pressure Vessels (Unfired) Rules, 1981
  - (e) Petroleum Act, 1934 and Petroleum Rules, 2002
  - (f) Factories Act, 1948 and Factory Rules
  - (g) The Dock Workers (Safety, Health & Welfare) Act, 1986 and The Dock Workers (Safety, Health & Welfare) Regulations, 1990
15. The consultant will mail draft report to experts of their Core Group and mail the final reports to all authorities concerned also.
  16. If on completion of the Hazard Analysis, the consultant will have to prepare the off-site emergency plan for that district. On the submission of the draft for the Off-site emergency plan, the consultant will have to facilitate the conduct of Mock-exercise in coordination of the District Authority and the Ministry. On the basis of the feedback received during the mock exercise, the off-site emergency plan will be finalized.

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## **MICRO METHODOLOGY FOR DISTRICT WISE HAZARD ANALYSIS**

### **A. VULNERABILITY ANALYSIS**

The scope of the study comprises a rapid safety audit of the MAH units involved and subsequently delineation of the vulnerable zone. In order to carry out a replicable consequence analysis, criteria for the following needs to be agreed to and accepted.

1. Risk Acceptability - Threshold values and exposure duration
2. Source Strength
3. Weather Class
4. Heat Radiation
5. Explosion
6. Assumptions

#### **1. Risk Acceptability:**

In order to arrive at an acceptable and pragmatic delineation of vulnerable zones for which planning efforts can be made, it is necessary to decide on risk acceptance criteria - i.e. in case of toxic gases, the cut-off threshold value will be IDLH. It is also necessary to indicate the time of exposure and arrival time of cloud. Since in this study, we will not carry out risk analysis, risk acceptance probability is not being considered.

#### **2. Source Strength**

Since the on-site emergency plan based on Maximum Loss Scenario, a catastrophic vessel failure needs to be assumed.

#### **3. Weather Class**

The weather class has a predominant influence on the dispersion process. Though neutral weather (class D) and a wind speed of 3 m/s should be assumed, in addition, extremely stable (class F) and a low wind speed of 1 to 2 m/s also need to be considered.

#### **4. Heat Radiation**

Usually first-degree burn is the criteria adopted for effect zone delineation. In addition, it may be necessary to indicate second degree and third degree burn distances.

## **5. Explosion**

We may consider peak over pressure of 0.1 bar.

## **6. Assumptions**

During simulation modeling following assumptions are to be made:

- (a) For pressurized containers; flash, aerosol formation and evaporation must be considered for the source strength calculations (typically flash portion may be doubled to account for aerosols and evaporation over approximately ten minutes is reasonable)
- (b) For gas liquid combinations such as 23% oleum, formaldehyde solutions, chloro-sulphonic acid and other mixtures; the source strength calculations must consider the concentration of active hazardous ingredient in the mixture.
- (c) Storage tanks shall be considered as “full” namely equal to the nominal or design capacity for modeling irrespective of operational considerations.
- (d) Results must be presented in SI units

## **B. MONITORING AND EVALUATION OF THE SCHEME**

1. Evaluation of the reports by the Core Group constituted in the Ministry of Environment & Forests.
2. Presentations by consultants to the Core Group.
3. Workshop in the industrial pocket under study to be organized by the consultant involving all industries and implementing authorities to gauge the acceptance of the report if off-site plan not recommended.
4. Incorporation of all suggestions and final submission of report by Consultants.
5. Communicate recommendations made, to enhance safety to the concerned industries and implementing authorities by MoEF.
6. Monitoring of the implementation of the recommendations by MoEF.

## **TERMS OF REFERENCE OF OFF-SITE EMERGENCY PLAN**

The scope of the consultant under the contract will be prepare an Off-site Emergency Plan for the selected industrial pocket based on the hazard analysis survey conducted earlier. The assignment will involve the following:

**A. Preparation of the Off-site Emergency Plan containing the following details:**

1. The types of accidents and release to be taken into account.
2. Organization involved including key personnel and responsibilities and liaison arrangements between them.
3. Information about the site including likely locations of dangerous substances, personnel and emergency control rooms.
4. Technical information such as chemical and physical characteristics and dangers of the substance and plant.
5. Identify the facilities and transport routes.
6. Contact for further advice e.g. meteorological information, transport, temporary food and accommodation, first aid and hospital service, water and agriculture authorities.
7. Communication links including fire fighting materials, damage control and repair items.
8. Special equipment including fire fighting material, damage control and repair items.
9. Details of emergency response procedures.
10. Notifying the public.
11. Evacuation arrangements.
12. Arrangements for dealing with the press and other media interests.
13. Longer term clean up.

The plan should be specific for the area and not a theoretical one. The plan should be prepared in consultation with all concerned officials and should be in line with the thinking of the Local Level Crisis Group and the District Level Crisis Group. The composition of which is provided in the draft rules on Emergency Planning, Preparedness and Response to Chemical Accidents.

**B. Training of all concerned officials:**

1. All the concerned authorities/Local Level Crisis Group Members /and the community needs to be trained. A two tier training schedule needs to be drawn up: one for the authorities; and the other for the local population.
2. At least three rounds of training should be carried out so that all the officials concerned are aware of their functions , duties and responsibilities.

**C. Translation of the Off-site Emergency Plan:**

The District Collector should be requested to translate the Off-site Emergency Plan approved by him in the local vernacular. Copies of the same should be distributed to all concerned officials.

**D. Mock- trial:**

1. A truncated trial involving all officials should be conducted in consultation with the Ministry of Environment & Forests.
2. A full scale mock-trial of the Off-site plan should be conducted on a date and time convenient to the District Collector in the presence of the officials of the Ministry of Environment & Forests.