JAWAHARLAL NEHRU PORT AUTHORITY

MARINE DEPARTMENT
SHEVA, NAVI MUMBAI – 400 707
MAHARASHTRA

CRISIS MANAGEMENT PLAN

JANUARY – 2024

FOREWORD

This study has been carried out by M/s Elazra Corporation, New Delhi, based on inputs received form Jawaharlal Nehru Port Authority. M/s Elazra Corporation would like to take this opportunity to extend their thanks to Jawaharlal Nehru Port Authority, management and officers who co-operated in supplying the data and information required, thus maximizing the effectiveness of the study. The study identified the hazards and analyzed the consequences of potential accident scenarios. The above study results, conclusions and recommendations were based on the information made available to Elazra Corporation at the time of study. Elazra Corporation exercised all reasonable skill, care and diligence in carrying out the study. However, this report should not be deemed as any undertaking, warranty or certificate and cannot be challenged in any court of law of the country.

Place : New Delhi
Date : 01.01.2024

Managing Partner

Corrigendum

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1. EXECUTIVE SUMMARY

Location of the port

Latitude $18^{0}56'43"$N, Longitude $72^{0}56'24"$E Port Area – 3000+ hectares.

A. Crisis

A Crisis is a sudden event or set of circumstances that could significantly affect an port ability to carry out its operation, that damages an port reputation and/or threatens the environment, the health, safety and wellbeing of workers, customers, or the public at large. If not handled in an appropriate and timely manner car if not handled at all. A crisis may turn into a disaster or catastrophe, crises are deemed to be negative, changes in the security, economic, political, societal or environmental affairs especially when they occur abruptly with little or no warning.

B. Crisis Management

Crisis Management (CM) is the overall coordination of an organization's response to a crisis, in an effective, timely manner, with the goal of avoiding or minimizing damage to the organization's profitability, reputation, or ability to operate and often involves the need to make quick decisions on the basis of uncertain or incomplete information.

CM includes the development of plans, based upon an integral approach with internal and external organizations, to reduce the risk of a crisis occurring and to deal with any crises that do arise, and the implementation of these plans so as to minimize the impact of crises and assist the organization to recover from them and restart its normal activities as quickly as possible.

C. Method

Port operators must be aware that "if you operate – things will happen". So better be prepared.

For developing a Crisis Management Plan, or to check their existing plans for completeness. These recommendations are based on

- The questionnaires provided by the authorizes persons,
- Additional interviews with selected authorizes persons,
- Information and material on Crisis Management efforts provided by authorizes persons,
- Literature and internet research on good practices and the state of the art and
- The review of these recommendations by selected authorizes persons.

D. Crisis Management Plan

A Crisis Management Plan should be considered as a super ordinated document with underlying emergency plans. It provides overall organizational and general procedural guidelines for the management of information, activities, operations and communications during an escalating emergency. It is the basis for the decision-making process of the port operation.

E. Risk Analysis

The development of a crisis management plan should start with an assessment of the potential vulnerabilities, risks, and threats facing a port operator and the evaluation of the crisis preparedness at the port, regional or local level.

At least, the risks of incidents arising from:

- Operations (accidents, collisions, fire, dangerous goods spillage),
- The environment (weather (flooding, storm), earthquakes),
- Actions by third parties (strikes, damage to infrastructure, rolling stock),
- Attacks by third parties (arson, sabotage, bomb threats, violence against customers and employees, cyber-attacks) should be considered.
- All safety equipment should be kept in working conditions at all times.
- Staff/workers should be given training time to time. Crisis Management Group's Telephone Numbers, Mobile Numbers, E-mail addresses should be kept updated.
- Crisis Management personnel's should be available at shortest possible time in case of any emergency.
- All interlocks should be kept and maintained in working condition at all times.
- In locations where flammable vapours may be present, precautions should be taken to prevent ignition by eliminating / containing source of ignition. Source of ignition may include open flames, lightening, smoking, cutting and welding operations, lighting / hot surfaces, frictional heat, sparks (static, electrical and mechanical), spontaneous and radiant heat.
- Periodical Inspection are to be carried out for the JNPA area.
- Ensure fixed fire protection systems for the port are conforming to OISD-Std-117.

Port Layout

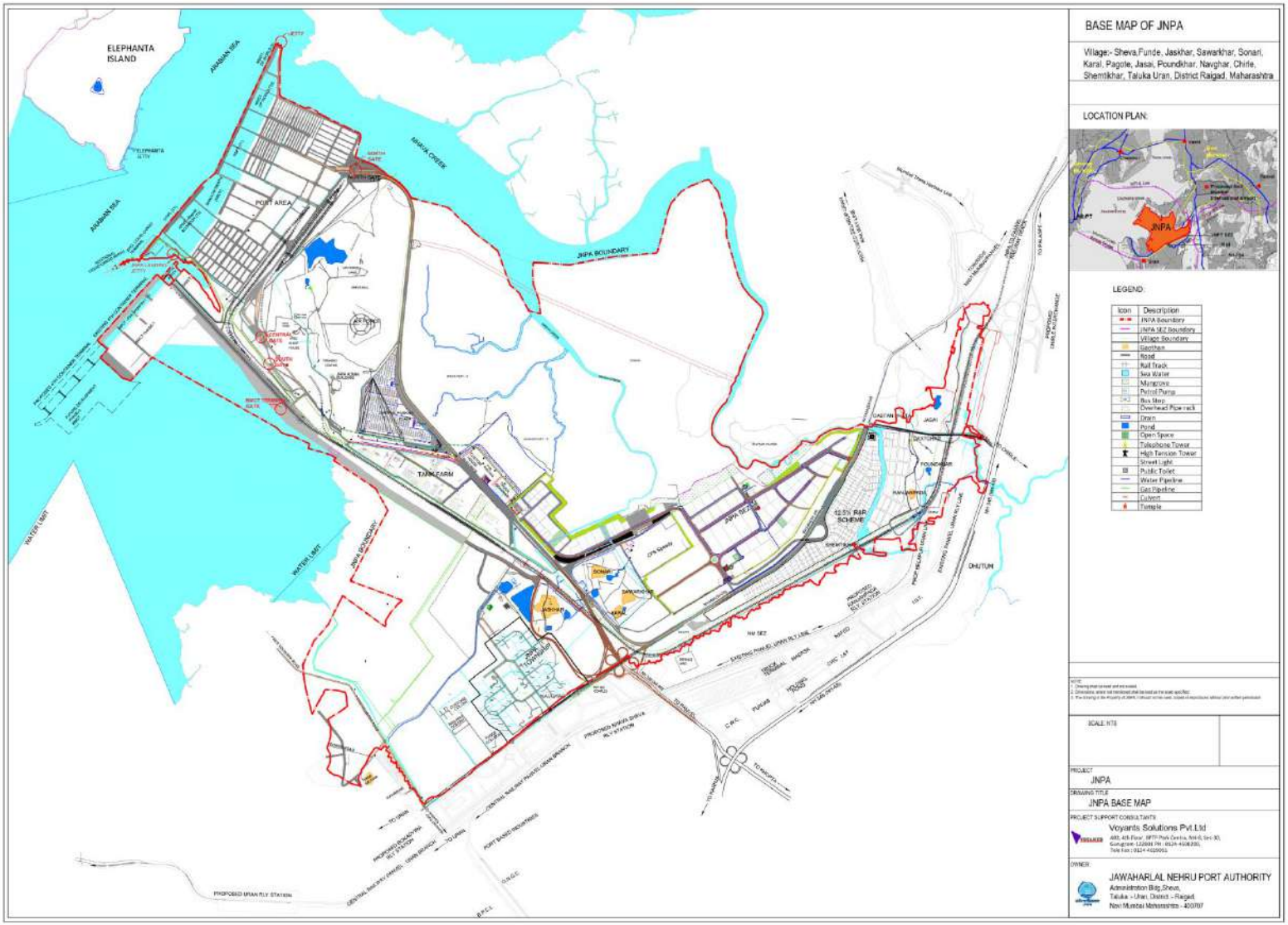


Figure No. 1: Layout of JNPA

Berth Location Details

Figure No. 2: Berth Location Details

2. INTRODUCTION

2.1 Crisis Situation

Types of crisis/disasters

Primarily crisis are triggered by natural disasters or human-induced, or result from a combination of both. In particular, human-induced factors can greatly aggravate the adverse impacts of a natural disaster.

Natural Disasters

Natural disasters as defined under National Disaster Management Plan 2016:

Table No. 1: Impact of natural disasters of JNPA

S. No	Broad Category of Disaster	Disaster	Impact
1	Geophysical	**i)** Earthquake	**a)** Urban fires triggered by earthquakes; **b)** Liquefaction - the transformation of (partially) water-saturated soil from a solid state to a liquid state caused by an earthquake and weakening foundations of terminal buildings **c)** Mass movement of earth materials, usually down slopes and increase **d)** Surface displacement of earthen materials thereby weakening structural strength
		ii) Tsunami	Tsunami waves travel at very high speed across the ocean but as they begin to reach shallow water, they slow down and the wave grows steeper. Increase height of tidal waves and tidal current of water.
2	Hydrological	**i)** Flood	**a)** Sediment erosion impacts bank protection works , water structures and terminal structures **b)** Structural damage to water structures and terminal structures **c)** Increase in water current **d)** Debris and mud flows decreases navigability of main area **e)** Damage to visual navigation aids **f)** Wave action decreasing navigability of small Ships and ferries

S. No	Broad Category of Disaster	Disaster	Impact
			g) Geomorphological changes changing course of main area
3	Meteorological	i) Cyclone and storm surge	a) Structural damage to water structures and terminal structures b) Damage Ships and ferries c) Debris and mud flows decreases navigability d) Disrupt navigation and communication system
		ii) Fog, frost and hail	a) Decrease in visual navigability b) Increase in incidents of collision/ contact
		iii) Sand Storm	a) Decrease in visual navigability b) Increase in incidents of collision/ contact
		iv) Lightning and Cloud Bursts	a) Danger to structures b) Danger of Electrocution on the Ship

Human-Induced Crisis

JNPA is at risk of crisis induced by its own functioning and operations and from crisis induced by the other users:

Table No. 2: Impact of human induced crisis.

S. No	Broad Category of Incident	Type of Crisis	Description	Impact on Sea
1	Ship Accident	i) Collision	An event where two navigating ships or craft suffer an impact with each other.	a) Impact on ships b) Injury to personal c) Damage to Ships d) Cargo Spillage e) Fire f) Loss of Hull integrity g) Sinking h) Pollution
		ii) Contact	An event where a ships or craft strikes something fixed, such as a navigation aid, berth, jetty	a) Damage to ships b) Injury to personal c) Loss of Hull integrity d) Problem in navigation in the approach area

S. No	Broad Category of Incident	Type of Crisis	Description	Impact on Sea
		iii) Fire/ Explosion	Fire can occur when flammable material, oxygen and sufficient ignition energy are available. Explosion depends on an atmosphere of a mixture of flammable material with oxygen. Cargo leakage might also lead to fire or sudden explosion	**a)** Loss of Cargo/ passenger **b)** Loss of Hull integrity **c)** Damage to ships **d)** Injury to personal **e)** Release of toxic fumes **f)** Pollution in the area
		iv) Capsizing	To (cause a boat or ship to) turn upside down by accident while on water	**a)** Mass casualty **b)** Damage to ship **c)** Loss of hull integrity **d)** Sinking **e)** Problem in navigation wherever grounding happens
2	Pollution	**i)** Cargo Leakage/ Spillage	Accidental cargo leakage/ spillage during transportation, transfer or storage especially cargo identified as dangerous goods	**a)** Impact on navigation **b)** Threat of fire/explosion **c)** Pollution will impact uses of water in the downstream like water supply, fishing, ecosystem **d)** Injury
		ii) Oil Spill	Accidental spill of oil transportation, transfer or storing	**a)** Impact on navigation **b)** Threat of fire/explosion **c)** Pollution will impact uses of water in the downstream like water supply, fishing, ecosystem **d)** Injury
3	Function Failure	**i)** Structural Failure	Failure of structural strength for which it was designed. It will include incidents starting from development of cracks (difficult to detect) to actual disintegration of the structure	**a)** Impact on navigation **b)** Damage to ship **c)** Injury to personal **d)** If the damage is on pipelines or gangway, this will impact transfer of cargo or passengers

S. No	Broad Category of Incident	Type of Crisis	Description	Impact on Sea
		ii) Equipment Failure	Equipment failure refers to any event in which any equipment cannot accomplish its intended purpose or task. It may also mean that the equipment stopped working, is not performing as desired, or is not meeting target expectations	**a)** Depending on the function of the equipment the impact will be on that part of the operations like electrical substation failure would cause problem in operating transfer of cargo, communication system, RIS, emergency alarm systems **b)** Injury to personal **c)** Damage to cargo
4	Human related	Labor Action	Labor unrest like strike, demonstration	**a)** Difficulty in operations **b)** Injury to personal
		Civil Disturbance	Outside of port area	**a)** Difficulty in operations **b)** Injury to personal

The basic information is required to be collected from the first respondent to support any ship/ ferry during a crisis management plan.

- Location (Position – Latitude/ Longitude, depth, etc.)
- Nearest Terminal
- Nearest Landmark
- Type of incident
- Type of ship (passenger or non-passenger)
- In case of non- passenger, what types of goods are being transported
- Spillage description
- Size of spillage
- Speed of the ship
- Was the ship/vessel moving Upstream or Downstream
- Brief description of the Scenario

2.2 Crisis Management Plan

The increase in likelihood of incidents due to growth in traffic, might affect the operations of ships thereby creating a crisis. This effect on JNPA's operations and facilities, information systems, critical records or personnel can undermine the viability of JNPA. A Crisis Management Plan can act as a guide in various crises at the port and terminals, and help in swiftly recovering from the impact. Crisis Management Plan will have following benefits:

a) Increasing the safety and well-being by providing a list of key contacts
b) Minimizing downtime and increasing productivity by providing clarity on roles and responsibilities
c) Reducing the environmental damage by defining specific response procedures to a variety of incidents
d) Minimizing the economic loss by integration with emergency plans for various situations
e) Reducing the legal liabilities

The crisis management plan is imperative for JNPA to manage an unexpected event/disaster by minimizing the impact of crises and consequently tangible damages (like security breaches) and intangible damages (like reputational damages).

HAZARD, RISK, VULNERABILITY & CAPACITY ANALYSIS

Disaster Risks, Vulnerabilities and Challenges

Disasters Classification (as per NDMA)

- Man-Made Disasters
  - Chemical

- Natural Disasters
  - Wind and Cyclone
  - Earthquake
  - Tsunami
  - Flood

Chemical Disaster

Chemical disasters may be traumatic in their impacts on human beings and may have casualties and also damages nature and property. The elements which are at highest risks due to chemical disaster primarily include the Port, its employees & staff, adjacent industries, hazardous chemicals vehicles, the residents of nearby settlements, adjacent buildings, occupants and surrounding community.

Chemical disasters may arise in number of ways, such as:

1. Process and safety systems failures
    - Human errors
    - Technical errors
    - Management errors
2. Induced effect of natural calamities
3. Accidents during the transportation (Loading/Unloading/Pipeline/Tank truck)
4. Hazardous waste processing/ disposal
5. Terrorist attack/ unrest leading to sabotage.

Wind and Cyclone

In accordance with national and regional hazard map available with BMTPC the Raigarh district falls under moderate cyclone damage risk zone (max. wind speed of 44 m/s).

Cyclones can cause damage to port infrastructures including damage to mangroves, trees and flooding of low line and poor drainage affected areas. In addition, ships in the harbour can also sustain serious damage and grounding.

Cyclones are classified by

- Strength of associated winds,
- Storm surges
- Exceptional rainfall occurrences.

Table No. 3: Wind speed Criterion for deep depression and cyclonic storm

Type of Disturbances	Wind Speed in km/h	Wind Speed in Knots
Depression	31-49	17-27
Deep Depression	49-61	27-33
Cyclonic Storm	61-88	33-47
Severe Cyclonic Storm	88-117	47-63
Super Cyclone	More than 221	More than 120
1 knot - 1.85 km per hour		

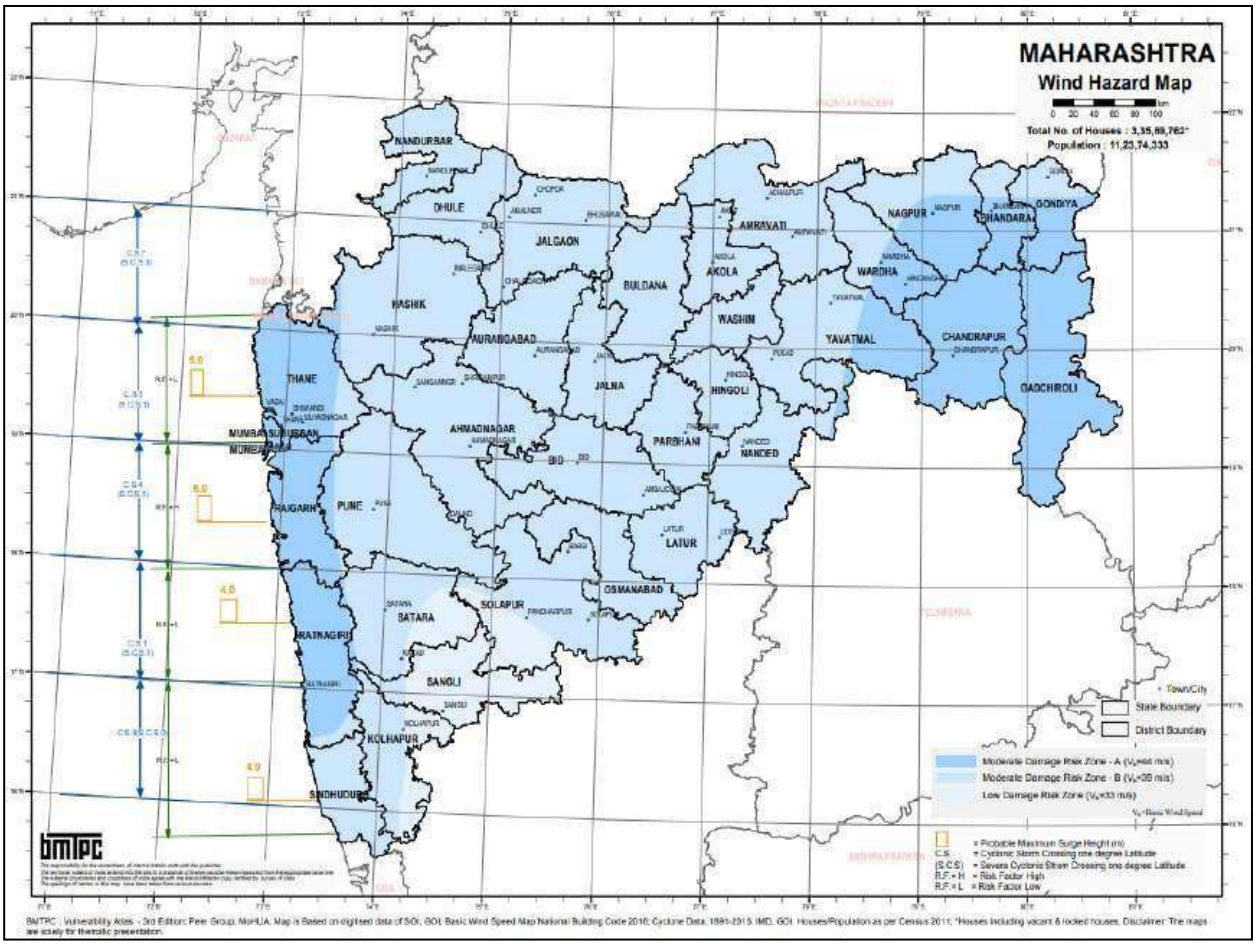


Figure No. 3: Wind Hazard Map (Source: Vulnerability Atlas of India)

Earthquake

Raigarh district which includes JNPA falls under Moderate earthquake damage Riskzone (zone category III).

Table No. 4: Classification of Earthquakes

Class	Scale
Great	8 or more
Major	7-7.9
Strong	6-6.9
Moderate	5-5.9
Light	4-4.9
Minor	3-3.9

The offices, utility buildings and berthing structures including cranes are required tobe constructed for damage zone III. The relevant BIS standards are as follows:

a) For office and other utility buildings – 2016 (IS 1893)
b) For berthing structures -2002

Though the port is a newly developed port (about 30 years) some infrastructure has deteriorated with time due to wind weather effects and aging. A time bound strategy will be undertaken by the port to assess the condition and strengthening of the older buildings and quay side structures that might be affected. This also applies to quay cranes and RMGs. A strategy to counteract the effects of land settlement in the port industrial zone will be adopted to mitigate risk.

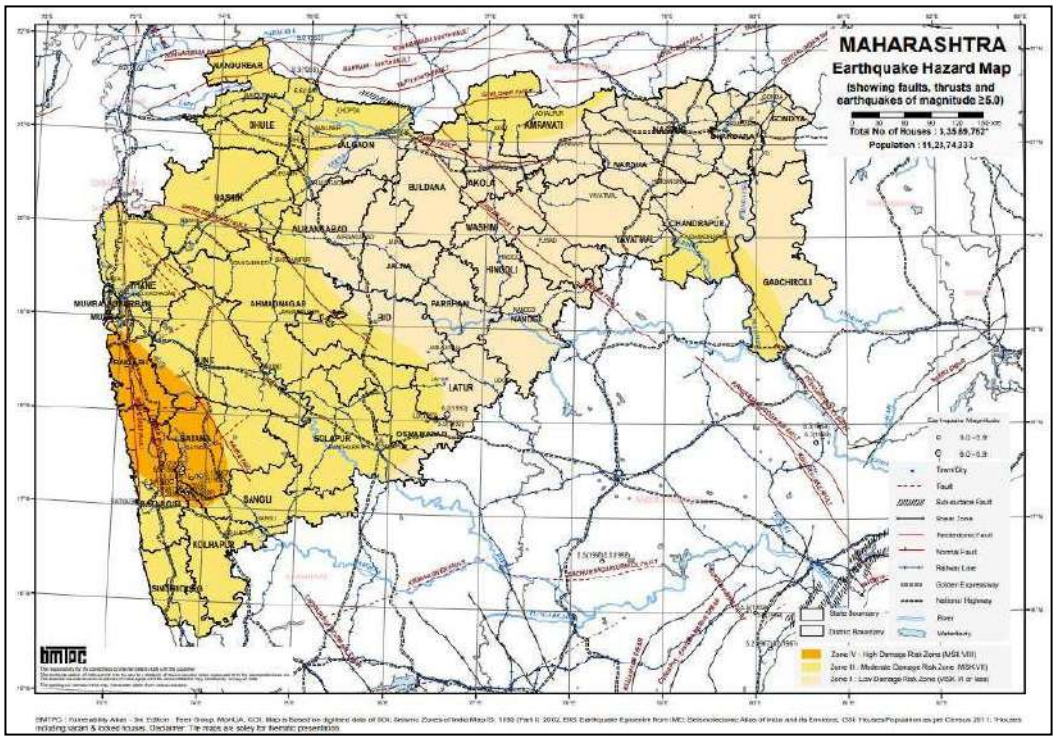


Figure No. 4: Earthquake Hazard Map (Source: Vulnerability Atlas of India)

Floods

JNPA being a coastal port in the Mumbai harbour region is bounded on the west by the waterfront, in the north and south by sea water quays. Therefore, has land boundary only on the eastern side. Flood prone areas are located in the latter zone. It comprises of villages where the drainage infrastructure is poor and instances of flooding have occurred in the past during heavy rainfall. The present port infrastructure as such doesnot face a flooding risk. A maximum surge height of 5 m has been recorded in the past for Raigad – Navi Mumbai coastal zone. The HTL & LTL has been demarcated by MCZMA in the published maps.

Port development plans for future expansion will take into account the strategy to takecare of the HTL affected zones within the areas earmarked for expansion allowing sufficient and planned capacity of storm drainage and natural slopes including reservoirs if any that might come within the development zone.

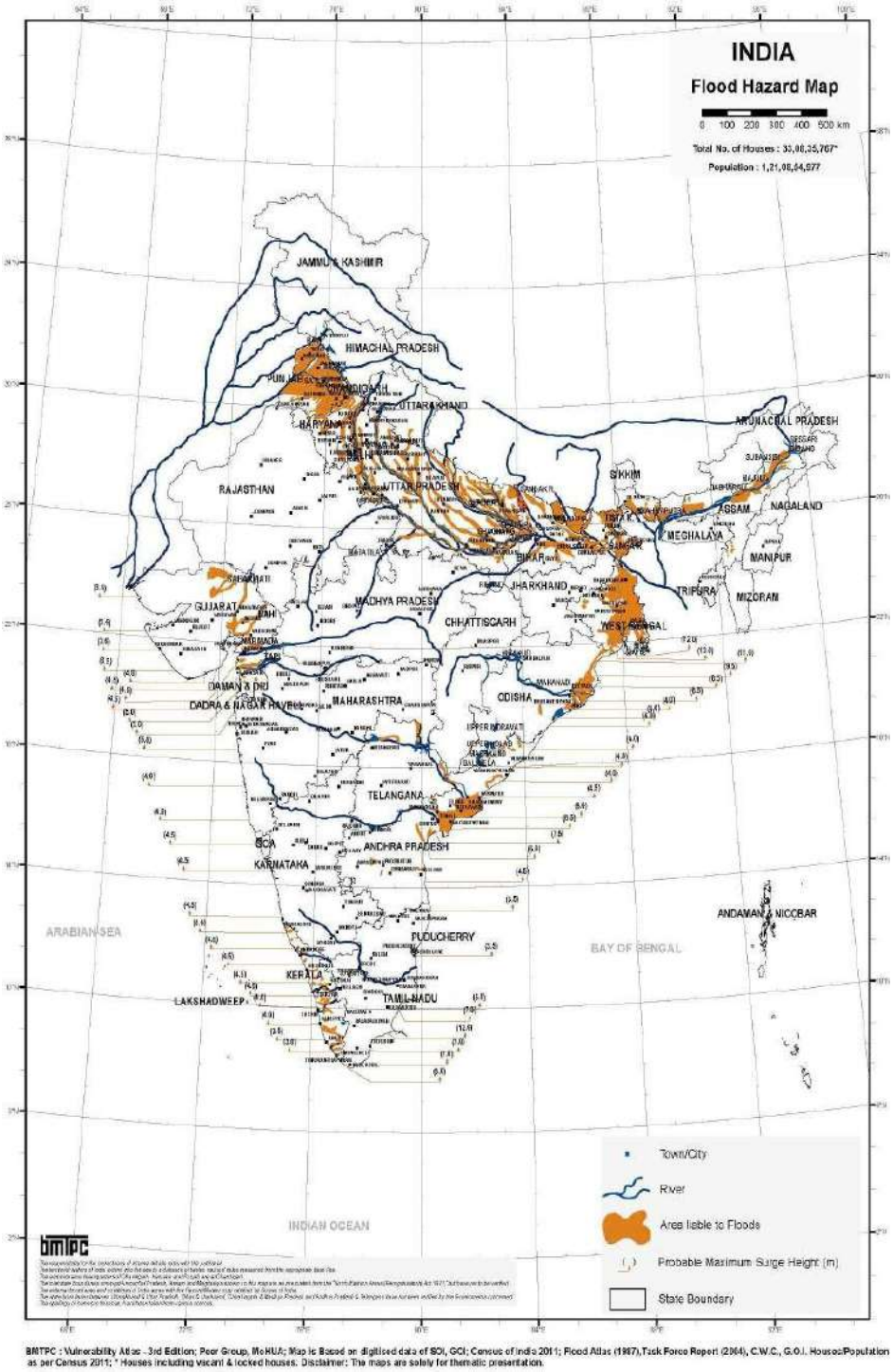


Figure No. 5: Flood Hazard Map (Source: BMTPC, India)

Tsunami

An Early Warning System for information related to earthquakes and generation of tsunami has been created under the Ministry of Earth Science, GOI.

A network of tsunami coastal stations has been setup which relay information to the center via satellites.

INCOIS provides such data to JNPA on a regular basis. Hence, adequate early warning will be available to the port. Necessary evacuation measures and provision oftsunami shelters will be provided.

Understanding Disaster Risks

In view of the complex nature of the navigational operations connected with pilotage of ships inside the narrow area and their traffic regulation by VTMS, weather variations including tidal windows etc., berthing complexities, turning circles and usage of tugs; HAZID workshop with various stakeholders connected to marine department was carried out. As a result, a better understanding of navigational risk was achieved.

Chemical Disaster (Fire / Explosion/Toxicity) Risks

These can be caused due to loss of containment of hazardous cargo (LPG, Naphtha, Ammonia etc.) handled in the Port. Fire incidents can also occur in the admin building, Port users building, utility craft etc. This type of hazard can be due to both Man-Made and Natural Disasters.

Potential scenarios for containers:

1. Loss of containment – Major leakage, a puncture or major loss of containment through 2.5”or more dia.
2. Loss of containment – Medium leakage, a puncture or major loss of containment through 1.0”or more dia.
3. Loss of containment – Small leakage, a puncture or major loss of containment through 0.2”or lesser dia.
4. Full Bore Rupture – BLEVE effect

Existing capacities for counter measures to deal with the above emergencies in the form of the firefighting arrangement (fixed and portable) and fire stations with trainedman power. In addition, MoA between JNPA and industries for fire and chemical disaster are also in place. Joint drills with all stakeholders are carried out periodically.

Oil Spill Disaster Risk

An Oil Spill Contingency Plan (OSCP) for the port emergency is prepared by the port and the same will be applicable in case of an oil and chemical spill disaster. This plan is prepared in accordance with the requirements of National Oil Spill Disaster Contingency Plan (NOS-DCP).

Natural Disasters Risk

In view of the historical records and HRVCA profile of the port the following natural disasters are considered for the preparation of the plans and their implementation.

1. Wind and Cyclone
2. Flood
3. Earth quake
4. Tsunami

The port is committed to update plans for the above mentioned geological and meteorological disasters on a periodical basis. Such updates include preparation/Updating of SOPs, structural assessments, project planning, environmental and utility management and provision of emergency equipment. These steps will highlight the strengths and weakness of the capabilities and thus creating resilience. The remedial steps if any will form part of institutional capability building.

CBRN/ Terrorism risk

Considering the threats of nuclear / radiological risk due to concealment of cargoes and mis-declaration, the port will take actions as directed by MoS and equipment and capability provided within the ambit of such directives. The steps for mitigation of risk due to terrorism will be considered separately as part of Port Facility SecurityPlan (PFSP).

2.3 Rationale of CMP

Authority and relevant Regulations

- The Disaster Management Act, 2005;
- National Disaster Management Plan , 2019;
- Post 2015 – Global Framework;
- Prime Minister of India's Ten-Point Agenda for Disaster Risk Reduction.

The Disaster Management Act, 2005

The Disaster Management Act, 2005 (DM Act 2005) lays down institutional and coordination mechanism for effective Disaster Management (DM) at the national, state, district and local levels. As mandated by this Act, the GoI created a multi-tiered institutional system consisting of the National Disaster Management Authority (NDMA) headed by the Prime Minister, the State Disaster Management Authorities (SDMA) headed by the respective Chief Ministers and the District Disaster Management Authorities (DDMA) headed by the District Collectors/ District Magistrate and co-chaired by Chairpersons of the local bodies.

The Disaster Management Act 2005, Section 36

This section of the act lays down the primary responsibility of ministries in the GoI and departments with respect to institutional framework for prevention and mitigation of disasters, allocating sufficient funds and other resources to the National and State government agencies.

The Disaster Management Act 2005, Section 37

This section of the act lay down the primary responsibility of ministries in the GoI and departments with respect to preparation of Disaster Management Plan, their review, Updating and its approvals. Measures for financing the activities within the plan are also required to be spelled out in the plan.

Post 2015 – Global Framework

The Post-2015 goals and agenda are set forth in the three landmark global agreements reached in2015 – the Sendai Framework for Disaster Risk Reduction (Sendai, Japan, March 2015), Sustainable Development Goals (UN General Assembly, New York, September 2015) and Climate Change Agreement (Conference of Parties, COP21, Paris, December 2015). The three documents set the stage for future global actions on DRR, sustainable development and climate change.

2.4 Objectives of the Plan

Crisis Management Plan (CMP) provides framework to JNPA managing all phases of crisis management cycle i.e. Pre- crisis (prevention, mitigation, risk reduction and preparedness), during crisis (response, communication and co-ordination) and post- crisis (recovery). Objective of CMP is that JNPA:

a) Improve the understanding of crisis and disaster risk, hazards, and vulnerabilities
b) Strengthen crisis risk governance at all levels from sub-office to Head office level
c) Invest in disaster risk reduction for resilience through structural, non-structural and financial measures, as well as comprehensive capacity development
d) Enhance Crisis preparedness for effective response
e) Prevent crisis and achieve substantial reduction of disaster risk and losses in lives livelihoods, health, and assets (economic, physical, social, cultural and environmental) by adopting prevention measures
f) Prevent and reduce hazard exposure and vulnerabilities to disaster
g) Capacity development at all levels to effectively respond to multiple hazards
h) Provide clarity on roles and responsibilities of various Departments and other stakeholders involved in different aspects of crisis management
i) Empower to have prompt response to any threatening crisis situation or crisis
j) Enable in assessing the severity or magnitude of effects of any crisis, coordinate and respond accordingly
k) Enable staff to conduct evacuation, rescue and relief
l) Recovery of operations

2.5 Scope of the Plan

CMP is intended to provide guidance to all concerned departments within the port with a general concept of potential emergency assignments before, during and following emergency situations in accordance with the priorities of SENDAI framework.

Disaster Management Cycle

Based on the culture of prevention and mitigation following a disaster or near disaster event, the capacity building measures are institutionalized.

Figure No. 6: Disaster Management Cycle

The primary objectives of the CMP are to:

a) To contain and control the emergency incidents,
b) Proactively safeguard the lives of the JNPA employees, contractors, stakeholders, visitors and neighboring population,
c) Mitigate the effect and minimize the damage to the environment,
d) Limit damages of port assets,
e) To ensure that the JNPA responds according to the priorities set by the Chief Incident Controller (CIC) during response operation,
f) Safely restore operations back to normal as quickly as possible after occurrence of any accident, to enable business to be resumed at the earliest,
g) To initiate off-site emergency plan in-case of necessity as and when required.

2.6 Making of the CMP (Methodology)

For the hazard and vulnerability, the analysis we have adopted the **ISO 31010:2009 Risk Management Risk Assessment** techniques and developed a risk matrix based on the likelihood of crisis and the consequences. The response levels required for the crisis, have been derived from the risk matrix. The risk matrix can be used as a screening tool for identifying the risks leading to various crisis and to determine which risks need to be addressed first and help communicate a common understanding for qualitative levels of risks across the organization.

Consequences

The consequence of the crisis is classified into four levels (C1 to C4) based on the level of impact. To define the impact we have considered three factors namely personnel safety, environmental damage and economic impact.

Personal Safety: The consequence of the accidents caused by a crisis vary from minor injuries to multiple fatalities, which depends on the type of accidents. The seriousness of casualties and incidents have been considered for defining the consequence level.

Environmental Impact: The resulting environmental damage can be negligible as well as permanent loss of flora and fauna. The main parameters of environmental impact is the level of damage to the flora and fauna due to amount and type of cargo/fuel spill.

Economic Impact: There are direct and indirect economic impacts of the consequence based on the damage, liability and compensation. The economic impact of Ship may be due to traffic rerouting and/or reducing the speed in order to reduce the probability of Ship strikes or other negative impact to endangered marine species. It may be due to constraints and penalties from unexpected delays, in addition to the additional transit time cost.

Likelihood

The classification of likelihood depends on various factors. To evaluate the likelihood of Ship collision, we have considered four factors and classified them into four levels (L1 to L4). The factors are technical hazard due to technological disruption, hydro meteorological and geographic hazard, human error, traffic and operational area hazard. Although, the likelihood also depends on the Ship type (for example a study in Japan indicated that the fishing Ships have high likelihood of accidents compared to other passenger ship or cargos), we have ignored the factor, as the data for Ship collision in India is unavailable

Technical Hazard: Technological hazards are generally considered a subset of man-made hazards. Although the level of susceptibility of a certain ship type relating kind of technological disruption is different, the likelihood depends on all the components in complex socio-technical systems, which promote errors and accidents. For example, poor ergonomics of equipment design technical error in optimal design speed etc.

Hydro, meteorological and geographic hazard: The likelihood varies both with geographic location and with time, reflecting the intensity of maritime traffic during different periods. Hence, we have considered geographic hazard as an indicator. The regime of the river changes from season to season. In addition, the likelihood depends on the hydro meteorological hazard. During the monsoon, the width of the waterways increases to several kilometers but navigable channel is still generally narrow and it can be stuck whereas during flash floods there is sudden surge in water, which can imbalance a Ship. The level of likelihood also varies from cyclones, gusty winds & heavy rainfalls. In case of inclement weather, strong wind creates pressure on lateral area of superstructure or lateral area of the Ship exposed to the weather, which tends to incline the Ship.

Human Error: It can another subset of human-induced hazards (which is defined as those "induced entirely or predominantly by human activities and choices". The major cause of human errors leading to crisis situations are error in control operation and errors due to failed communication. For example a study in Bangladesh, revealed that the majority of Ships plying the rivers do not have fitness certificates or route permits. Sometimes, the passenger Ship owners tend to overload by doubling or tripling the actual carrying capacity of their Ships, which causes the Ship unstable. A safe design of the Ship is prerequisite for the stability of the Ship. If a Ship inclines up to a certain angle (angle of vanishing stability), then it will not to be able to return of its upright condition thus it will incline more and losses its stability.

Traffic and Operational Area Hazard: The probability of incidents also increases with the increase of the traffic volume. Almost all material from terminal approach channel related maintenance dredging is relocated to offshore material placement areas. In many cases maintenance dredged material is high in silt and clay content, increasing turbidity of water, which leads to accidents.

3. CRISIS MANAGEMENT PLAN (CMP)

Risk Estimation

Table No. 5: Scale of Impact (I0 – I4)

Scale	People	Property	Environment	Port Business
I0	No injury	No damage	Negligible environmental impact	Negligible
I1	Minor (Single slight injury)	Minor damage	Minor Tier 1 oil spill, Minimal environmental harm	Minor
I2	Slight (multiple minor or single major injury)	Local damage	Moderate Tier 2 (limited outside assistance) oil spill or environmental amenity impaired, Moderate environmental impact	Moderate Bad local publicity or short term loss of dues, revenue, etc.
I3	Serious (multiple major injuries or single fatality)	Major damage	Serious Tier 2 (regional assistance) oil spill, localized flooding or multiple amenities impaired, Long term or serious environmental damage	Serious Bad widespread publicity, temporary port closure or prolonged restriction of navigation
I4	Major (More than one fatality)	Total loss	Major Tier 3 (national assistance) oil spill, widespread flooding or extensive damage to amenities, Major environmental harm. e.g. major pollution incident causing significant damage or potential to health or the environment	Major Port closes, navigation seriously disrupted for more than 1-2 days. Long term loss of trade

Table No. 6: Frequency scale (F1- F5)

Category	Descriptive term	Definition
F1	Frequent	An event occurring once a week to once an operating year
F2	Likely	An event occurring once a year to once every 10 operating years
F3	Remote	An event occurring once every 10 operating years to once in 100 operating years
F4	Unlikely	An event occurring once every 100 operating years to once in 1000 operating years
F5	Rare	Considered to occur once in more than 1000 operating years

Risk Assessment Matrix

For each identified hazard, risk quantification is done based on a scale of 1 (low risk) to 10 (high risk) as described in the Table 7 as below:

Table No. 7: Risk Assessment Matrix

Impact	**I4**	**5**	**6**	**7**	**8**	**10**
	I3	**4**	**5**	**6**	**7**	**9**
	I2	**3**	**3**	**4**	**6**	**8**
	I1	**1**	**2**	**2**	**3**	**6**
	I0	**0**	**0**	**0**	**0**	**0**
Frequency		**F5**	**F4**	**F3**	**F2**	**F1**

Where: -

0 & 1 - Negligible Risk
2 & 3 - Low Risk
4, & 5 – Assessed to be in ALARP region
6 – Heightened Risk
7, 8 & 9 - Significant Risk
10- High Risk

Based on the values of frequency and impact as assessed, Risk Ranking have been done in Table 8.

Risk Ranking

The risk score of each of the four categories (People, Property, Environment and Business) is analyzed to obtain four indices for each hazardous scenario as follows:

a) The average risk value of the four categories in the 'most likely' set.
b) The average risk value of the four categories in the 'worst credible' set.
c) The maximum risk value of the four categories in the 'most likely' set.
d) The maximum risk value of the four categories in the 'worst credible' set.

The hazardous scenarios list is then sorted in order of the aggregate of the four indices to produce an Assessed Risk Ranking List, in descending order, with the highest risk scenario prioritized at the top.

Table No. 8: Risk ranking for JNPA for identified hazards

Scenario No.	Rank No.	Area	Category	Hazard Detail	Assessed Risk							
					Most Credible				Worst Credible			
					People	Property	Environment	Business	People	Property	Environment	Business
10.2	1	2	Collision	Collision between two ships	8	8	0	8	7	7	6	7
1,2,6	2	4	Leakage-Fire/Explosion	Fire /Explosion due to LPG/POL/ Chemical leakage	7	7	6	6	7	7	6	6
3,4	3	4	Toxic	Ammonia/Acrylonitrile leak at liquid cargo jetty during operation – on Ship or Ashore	7	3	6	7	7	4	6	7
17.2	4	8	Natural Disaster	Flood	6	6	3	7	6	5	6	6
8	5	8	Fall	Containers falling into water in case of extreme weather, ship collision or grounding	2	2	0	2	3	5	2	5
17.1	6	8	Natural Disaster	Cyclone	7	6	3	7	6	6	3	6
7	7	5	Fire/Leak	Crane Accidents (Load drop/crane fall) at Container terminals	6	6	0	3	7	7	3	6
10.7	8	2	Collision	Collision – passing ship in port waters (unregulated traffic)	3	6	0	3	6	6	4	7
10.11	9	2	Fire	Fire on ship in navigational area	6	3	0	6	6	6	5	6
15,16	10	8	Civil Disturbance	Fire/Explosion (War and Terrorism, Bomb Threat)	5	5	5	6	5	5	5	5
12	11	9	Fire/Explosion/Leakage	Emergency/Disaster within the tank farm facility	6	3	0	3	6	6	5	6
10.4	12	2	Grounding	Grounding-Tanker/Container/BC transiting in area	2	4	0	6	5	5	5	6
5	13	4	Corrosion	Phosphoric acid leakage at BPCL Jetty	6	3	3	3	6	4	4	4

Scenario No.	Rank No.	Area	Category	Hazard Detail	Assessed Risk							
					Most Credible				Worst Credible			
					People	Property	Environment	Business	People	Property	Environment	Business
10.1	14	2	Collision	Collision with small craft-Tanker/Container/BC in area	3	6	0	3	6	6	2	6
17.3	15	8	Natural Disaster	Tsunami	6	4	2	6	5	5	3	5
10.5	16	2	Grounding	Grounding – During pilotage of deep draft Ship	2	2	0	6	3	6	3	6
17.4	17	8	Natural Disaster	Earthquake	4	2	0	6	5	5	5	5
14	18	6	Fire	Fire in the Admin building/PUB/ Custom House/POC	3	3	0	3	7	6	2	7
11	19	2	Blockage of Navigational area	Blockage of Navigational area due to Ground/Sinking of ship (Wreckage)	0	2	0	4	5	5	3	6
10.3	20	1	Contact	Tanker/Container/BC tug assisted berthing – Contact with jetty	3	3	0	3	6	6	2	6
10.9	21	1	Contact	Contact – During operations in turning circle	0	3	0	3	5	6	5	6
10.10	22	2	Collision	Collision with channel marking buoys	0	3	0	3	5	6	5	6
13	23	7	Fire	Fire in CFS Warehouse	3	3	0	3	6	6	2	4
10.8	24	3	Collision	Collision – Anchor dragging	2	2	0	2	5	6	5	6
10.6	25	2	Collision	Collision with dredger within navigational the area	0	2	0	2	6	6	3	6
9	26	1	Fire	Fire in Engine room of floating craft	3	3	0	3	4	4	2	2

3.1 Pre-crisis – This phase helps in identifying hazards and minimizing known risks.

a) Step 1 – Surveillance

Surveillance for crisis management at the Jawaharlal Nehru Port Authority (JNPA) involves a combination of physical and technological measures to ensure the safety and security of the port facilities. The surveillance framework is as follows:

1. **Risk Assessment:**

- Identify potential risks and threats specific to the port environment.
- Consider factors such as natural disasters, terrorist activities, cyber threats, and other potential crises.

2. **Perimeter Security:**

- Implement robust perimeter security to control access to the port.
- Install fencing, barriers, and gates to secure the boundaries.
- Use surveillance cameras to monitor key entry and exit points.
- All out gates provided with vehicle radio detection system

3. **CCTV Surveillance:**

- Install a comprehensive network of CCTV cameras across the port facilities.
- Ensure coverage of critical areas such as entrances, exits, storage yards, and sensitive infrastructure.
- Utilize high-resolution cameras for clear imagery.

4. **Access Control:**

- Implement access control systems for restricted areas.
- Use biometric systems, access cards, and other authentication methods.
- Regularly update access credentials to limit unauthorized entry.

5. **Intrusion Detection Systems:**

- Deploy intrusion detection systems to identify unauthorized access or suspicious activities.
- Integrate with alarms and alerts to notify security personnel in real-time.

6. **Communication Systems:**

- Establish robust communication systems for emergency response.
- Ensure that security personnel, emergency responders, and relevant authorities can communicate effectively.

7. **Incident Response Plan:**

- Develop a detailed incident response plan outlining specific procedures for different types of crises.
- Conduct regular drills and training exercises to ensure that the response team is well-prepared.

8. **Cyber security Measures:**

- Implement cyber security measures to protect against cyber threats.
- Regularly update and patch software systems to address vulnerabilities.

9. **Collaboration with Authorities:**

- Establish partnerships with local law enforcement, emergency services, and other relevant authorities.
- Share information and coordinate response efforts.

10. **Monitoring and Analysis:**

- Implement systems for continuous monitoring and analysis of surveillance data.
- Use analytics tools to identify patterns and potential risks.

11. **Backup and Redundancy:**

- Ensure redundancy in surveillance systems to prevent failures during critical situations.
- Implement backup power sources and data storage.

12. **Community Engagement:**

- Engage with the local community to foster cooperation and share information.
- Establish communication channels for reporting suspicious activities.

13. **Regular Maintenance:**

- Conduct regular maintenance of surveillance equipment to ensure functionality.
- Keep software and firmware up-to-date to address security vulnerabilities.

14. **Legal and Ethical Considerations:**

- Ensure compliance with local and national laws regarding surveillance and data privacy.
- Establish clear guidelines for ethical use of surveillance data.

b) Step 2 – Detection

BUILD UP OF EMERGENCY

ANY ONE-NOTICING EMERGENCY

- Shout FIRE – FIRE – AAG so that many people become aware of an emergency
- Inform nearest shift – in – charge or POC control room by giving caller name, place & nature of emergency.
- Wait for the instructions from Site Incident Controller.

MARINE EMERGENCY (PILOT ON DUTY SHALL BE IMMEDIATE SITE INCIDENT CONTROLLER)

These emergency situations are as follows:

- Collision of ships
- Person(s) falling in harbour water
- Grounding of vessel
- Fire in ship
- Explosion in ship
- Toxic release in ship
- Oil spill from ship and marine pollution

  Oil spill can result from:

  - ✓ Collision of ships in the channel
  - ✓ Grounding of ships in the harbour
  - ✓ Collision of ships with berth
  - ✓ Bunker spills
  - ✓ Spills from ships during cargo operations
  - ✓ Spills from land pipelines
  - ✓ Spills from loading arms/hoses
  - ✓ Fire and/or Explosion on ships or ashore
  - ✓ Spills from Jawahar Dweep/MbPT
  - ✓ Storm, Flood and other natural calamities
  - ✓ Collapse of lifting appliances in ship
  - ✓ War, civil disturbances and terrorism

☞ **Duty Dock Master/Senior working pilot in coordination with Pilot on duty shall declare the emergency.**

PORT EMERGENCY (TERMINAL SHIFT INCHARGE ON DUTY SHALL BE IMMEDIATE SITE INCIDENT CONTROLLER)

These emergency situations in port area are as follows:

- Fire
- Explosion
- Toxic release
- Oil spill and marine pollution
- Person(s) falling in harbour water
- Storm, Flood and other natural calamities
- Collapse of lifting appliances, buildings, sheds, etc.
- War, civil disturbances and terrorism

☞ **Concerned terminal shift in charge shall declare port emergency.**

ACTUATING OF SIREN

☞ **Siren for declaring Emergency**

1. On receipt of the information about the Emergency, the control station will authorise CISF at Central Gate Complex to actuate the Emergency Siren as follows: -
   - Siren to be sounded continuously for 30 Seconds with an interval of 5 Seconds to be repeated 10 times.

☞ **Siren declaring Evacuation from the Port area.**

1. On receipt of the orders from the Deputy Conservator or in his absence the Harbour Master the port control room will authorize CISF at Central Gate Complex to actuate the Siren as follows:
   - Siren declaring Evacuation from the Port area : Siren to be sounded for 5 seconds till the area is evacuated by people or for ½ hour whichever is less

☞ **Siren declaring All Clear and returning to the work.**

1. On receipt of the information from the Deputy Conservator or in his absence Harbour Master the port control room will authorise CISF at Central Gate Complex to actuate the Siren as follows:
   - Continuous ringing of siren for 5 minutes

Note: CISF at Central Gate Complex is to be contacted on telephone nos. 27242354/ 27244682 / 67814682

ASSEMBLY POINTS

Following places are earmarked as assembly points

1. CT Shift in-charge office
2. In front of POC Building
3. POC Canteen Building
4. In front of Administration Building
5. NSDT
6. TT Maintenance Section
7. Office of Dy. Manager (LCB & NSDT)
8. ICD Building
9. E-7 Substation (near CB-2)

GENERAL EMERGENCY RESPONSE

COLLISION OF SHIPS

Action By	Action
Site Incident Controller (SIC)	1. Immediately inform port control room and activate Emergency Action Plan 2. Inform engine room and ask for engines to be on standby 3. Take actions in consultation with Master of the vessel
SIC + Master	1. Inform relevant authorities / owners and complete legalformalities 2. Assess the situation for injuries, leakages, take sounding oftanks, and bilges 3. Check for oil spills from vessel and activate Oil SpillResponse Plan. 4. Check for vessel damage / damaged areas 5. Check assistance to other vessel 6. Check for cargo damage 7. Arrange evacuation of personnel if necessary 8. If required close water tight doors to minimize furtherdamages 9. Alert vessels in vicinity – inform vessel name, call sign, portof registry, nationality, owner's name 10. Fix time and position of the accident 11. Note the course and speed at the time of incident and subsequent actions/incident 12. Prepare life boats for lowering and keep lifesavingequipment stand by as necessary

PERSON(S) FALLING IN THE HARBOUR WATER

Action By	Action
Site Incident Controller (SIC)	1. Immediately inform port control room and activate Emergency ActionPlan 2. Throw lifebuoys in water so that person is able to float in water 3. Inform all crafts/vessels in the vicinity to start rescue operation 4. Arrange for launch to rescue the person(s) 5. Review Emergency Action Plan of the contractor in case the victims arecontractor's employees

GROUNDING OF VESSEL

Action By	Action
Site Incident Controller (SIC)	1. Immediately inform port control room and activate Emergency ActionPlan 2. Take actions in consultation with Master of the vessel
SIC + Master	1. Inform relevant authorities / owners and complete legal formalities 2. Check for oil spills from vessel and activate Oil Spill Response Plan. 3. Prepare life boats for lowering and keep lifesaving equipment stand byas necessary 4. Review various tanks to know depth of the water. Plot exact position ofthe vessel on the chart 5. Decide whether the vessel can be refloated by using its own power/towing arrangement/uploading of cargo/waiting for high tide

STORM WITH SIGNAL NO. 3 OR ABOVE

Action By	Action
Port Control Room	1. Immediately inform Pilot 2. Take actions in consultation with Pilot and activate Emergency ActionPlan 3. Inform DC/HM 4. Inform all terminals
Site Incident Controller (SIC)	1. Contact all ships and ask them to stand by for further communications 2. Inform and ask Masters to keep the Ships ready to proceed to sea atshort notice 3. Keep the tugs on stand by 4. Pilots to patrol the harbour by the tugs/ launches to ensure that allprecautionary measures are taken by all the vessels in the port 5. Ensure that all barges / small vessels are directed to go to the sheltered area. The fishing trawlers and fishing crafts to be sent to safer place

Action By	Action
	6. Coordinate with external agencies such as Indian Navy, Coast Guard,Statutory bodies etc. during the storm 7. Stop cargo work if necessary. Ship discharged cargo to safer place 8. Secure and shift cranes to safer place 9. Secure loose or heavy items / electrical equipment 10. Inform ships alongside berths to double up their moorings and provideshore gang assistance

FLOOD (IN ADDITION TO REQUIREMENT OF THE STORMFOLLOWING ACTIONS TO BE TAKEN)

Action By	Action
Site Incident Controller (SIC)	1. Ensure all emergency Equipment in order 2. Keep rescue team ready with rubber boats, Life jackets etc. 3. Evacuate people from the area 4. Once storm warning is received all ships in port to keep their engines ready, Double up moorings, Close all hatches and move out to sheltered or safe area 5. Shift hazardous cargo out of the port 6. Cut off electrical supply as relevant and cover the junction boxes, electrical panels with water proofing sheets during and after flood is over 7. Do not switch on electrical supply unless safe. Use battery operated lights 8. Carry out rescue operation for trapped persons 9. Arrange resources such as cranes to remove debris 10. In case of grounding / capsizing of ships, arrange resources to restore normalcy 11. In case of oil spill activate Oil Spill Response Plan. 12. Handle hazardous cargo (washed with water) with proper protective equipment

COLLAPSE OF LIFTING APPLIANCES, BUILDINGS, SHEDS

Action By	Action
Port Control Room	1. Immediately inform Shift In Charge 2. Take actions in consultation with Shift In Charge/Pilot and activate Emergency Action Plan 3. Immediately inform Duty Dock Master/Pilot In-charge 4. Inform Terminal In-charge in consultation with Duty Dock Master/Pilot In-charge
Site Incident Controller (SIC)	1. Stop cargo work if necessary 2. Secure and shift cranes to safer place 3. Arrange mobile cranes, earthmoving equipment, first aid, firefighting equipment, vehicles etc.

Action By	Action
	4. Cut off electrical supply if necessary 5. Priority to be given to the rescue injured/trapped person under debris by removing the debris without carrying harm to trapped people and give them first aid 6. In case of any danger of fire/explosion due to the type cargo involved appropriate care to be taken while removing/clearing debris 7. In case the container / shed / building have the dangerous cargo, isolate and keep watch. 8. In case of collapse of lifting appliances dismantle, repair and renew 9. In case of collapse of building/shed the debris to be removed completely and alternative arrangements to be made to restore normalcy

FIRE AND OR EXPLOSION (SHIP/PORT AREA)

Action By	Action
Anyone who notices fire	1. Inform port Control Room & Fire Station and if possible give details of fire source 2. Try to find more information about nature of fire and inform port Control Room & Fire Station
Port Control Room	1. Immediately inform Duty Dock Master / Pilot In-charge 2. Take actions in consultation with Pilot / Shift In Charge and activate Emergency Action Plan
Fire Coordinator	1. Check type of fire/leaked material 2. Refer response procedure (based on IMDG codes) 3. Use proper personnel protective equipment ☞ **Remember:** Unignited vapour cloud of flammable material can explode due to static electricity generated by movement of fire vehicles. Use stop, watch & proceed policy before responding such emergencies.
Site Incident Controller (SIC)	1. Ensure that all barges / small vessels are directed to go to the sheltered area. The fishing trawlers and fishing crafts to be sent to safer place 2. Stop cargo work if necessary. Ship discharged cargo to safer place 3. Inform engine room and shut down electrical circuits if necessary 4. Arrange firefighting team 5. Alert vessels in vicinity 6. If possible keep the vessel ready to move out **If fire is onboard the ship which is at anchorage** 1. Water borne firefighting equipment is available with port such as firefighting tugs with fire monitors, lifesaving equipment and medical equipment

Action By	Action
	If fire is in port terminal / cargo storage areas 1. Based on the type of cargo involved initiate relevant response 2. Use proper personal protection and extinguishing media 3. Assess the situation from time to time and use appropriate strategy 4. Remove unaffected containers/goods from the area if possible **Important** 1. For substances, which becomes dangerous when wet/ violently react with water use dry chemical for small fire. For large fire smother withdry inert material and dispose them off using relevant safety precautions 2. Alcohols & glycols are not compatible with all types of foam. They degrade the foam and break it down and thus limiting its effectiveness. Use low protein foam 3. For petrochemical fire use high expansion foam, do not use water jet on fire

TOXIC RELEASE (SHIP / PORT AREA)

Action By	Action
Anyone who notices release	1. Inform POC Control Room & Fire Station and if possible givedetails of release source 2. Try to find more information about nature of release and informPOC Control Room & Fire Station
Port Control Room	1. Immediately inform Pilot / Shift In Charge 2. Take actions in consultation with Pilot / Shift In Charge andactivate Emergency Action Plan
Fire Coordinator	1. Check type of leaked material 2. Refer response procedure based on IMDG codes 3. Use proper personal protective equipment ☞ **Remember :** Unignited vapour cloud of flammable material can explode due to static electricity generated by movement of fire vehicles. Use stop, watch & proceed policy before responding to such emergencies.
Site Incident Controller (SIC)	1. Ensure that all barges / small vessels are directed to go to the sheltered area. The fishing trawlers and fishing crafts to be sent tosafer place 2. Stop cargo work if necessary. Ship discharged cargo to saferplace 3. Inform engine room and shut down electrical circuits if necessary 4. Arrange firefighting team 5. Alert vessels in vicinity 6. If possible keep the vessel ready to move out

Action By	Action
	If release is onboard the ship which is at anchorage 1. Water borne firefighting equipment is available with port such as firefighting tugs with fire monitors, lifesaving equipment and medical equipment **If release is in port terminal / cargo storage areas** 1. Based on the type of cargo involved initiate relevant response 2. Use proper personal protection & extinguishing media 3. Assess the situation from time to time and use appropriate strategy 4. Remove unaffected containers/goods from the area if possible. ☞ For substance, which becomes dangerous when wet/ violently react with water use dry chemical for small release. For large release smother with dry inert material and dispose them off using relevant safety precautions. **Action in case of LPG leakage/fire** 1. Evacuate people from the area to safe place as there is danger of rupture. 2. Approach the leak/ fire with minimum 2 ½ inches water hoseswith water screen to cool the vapour cloud/tank and fire fighters. 3. Cool LPG tanks sufficiently from at least three sides placingmajor emphasis on cooling vapour area of tanks. 4. If possible close outlet valve of the tank to stop further leak. 5. Keep adjacent material cool with water. 6. Remove undamaged and cooled material to a safe place. **Action in case of ammonia leak** 1. Evacuate the area immediately. 2. Isolate the hazard area. 3. Keep out unnecessary and unprotected personnel. 4. Use personal protective equipment as required. 5. Eliminate ignition sources. 6. Knock down gas with fog or fine water spray. 7. Do not direct water at spill or source.

Action By	Action
	Action in case of chlorine leak 1. Evacuate the people from the area (Combination with HydrogenGas causes explosion in presence of any form of energy). 2. If possible shut off the outlet valve of the cylinder/ tank. 3. Use Caustic Soda/ Soda Ash or hydrated lime to neutralize. 4. Use dry chemical powder to shut off the fire. 5. Remove undamaged material to safe place. **Important:** • If leak involves large amounts of chlorine, evacuate the area. • Do not use water on chlorine because it produces hydrochloricacid.

POLLUTION BY OILS

Action By	Action
Anyone who notices	1. Inform POC Control Room and if possible give details of thesource. 2. Try to find more information and inform POC Control Room.
POC Control RoomOffice	1. Immediately inform Pilot / Shift In Charge / MCPC Section. 2. Take actions in consultation with Pilot / Shift In Charge / MCPCSection and activate Emergency Action Plan.
Site Incident Controller (SIC)	1. Stop cargo work if necessary. Ship discharged cargo to saferplace. 2. Arrange fire-fighting team. 3. Alert vessels in vicinity. 4. If possible keep the vessel ready to move out. 5. Arrange for resources/ equipment such as oil booms, dispersant,tugs, barges for combating oil pollution. 6. Stop the source of leak by taking proper precautions.

WAR

When war like situation is developed or during the declaration of war the priority is to be given to all important/ critical areas to remain vigilant to prevent sabotage, to remain readiness to combat emergency and to keep normal operation going.

Prior Emergency Situation

- Set up crisis management center and manned continuously.
- Crisis Management Group (CMG) to declare plan / guidelines to be followed which could be based on Government of India / Statutory bodies / Indian Navy / Air force / Governmentof Maharashtra etc. instructions.
- CMG to ensure utmost vigilance in identified critical area to ensure the adequate resources in terms of security personnel, experts in handling equipment, trained manpower, flood lights, earth moving equipment, mobile cranes, rescue crafts are available to guard all gates, roads etc. In case of any unidentified person is found, he must be handed over to police.
- CMG to ensure that evacuation plan is prepared and backup systems such as power generator, communication equipment, safety systems are working. CMG should also ensure that all required manpower such as electricians / technicians/labour are availableany time.

During the Emergency

- CMG to adopt relevant Emergency Action Plan to combat the emergency.
- In case of an enemy attack inform relevant authorities & internal security to defend installations.
- When additional security (army/BSF) arrives, situation is to be handled jointly.

c) Step 3 – Warning/Alert

Early Warning/ Alert System

Receiving and managing alerts

Information of the occurrence of incidents in and around JNPA area may come from a variety of sources. On receipt of information designated Personnel must carry out investigation to confirm the incident and gather as many details and as quickly as possible:

- Prepare an incident report.
- Immediately forward the report to and inform the Dy. Conservator/Harbour master.

The information so collected shall be maintained by making hourly log entry in a register.

Activation of EOC and initial resource coordination

Establishing the Emergency Operational Centre

Location

The EOC will be located in the Port Control room or secondary control room which is Chamber of Chief Manager (Admin) & Secy. located in the Admin building or as directed by the Chairman).

For small scale or short duration responses, the local EOC will be used inside the port. For larger scale responses, where external help is needed the Main Office Area will be utilized along with local EOC.

Muster Point

IRT personnel will muster at the nominated EOC unless otherwise directed by the SIC.

First Person On-Site

The person who arrives first at the EOC premises will commence preparation for the meeting.

Responsibility

The designated CIC/SIC will mobilize IRT members.

Resource mobilization

The CIC/SIC will ensure mobilization sufficient equipment and personnel resources required to manage the response.

Direction, control and coordination – Function coordination amongst IRT

The overall responsibility of the Emergency management lies with the Dy. Conservator, JNPA. He assumes the responsibility of CIC on receipt of the information of an impending emergency.

Some of the critical functions are:

- Activation of the EOC,
- An ongoing emergency assessment, including upgrading or downgrading of the emergency alarm level,
- Notification of outside governmental agencies,
- The decision to ask for outside help and resources,
- The decision to evacuate people,
- Decisions involving the safety of offsite vulnerable points (e.g recommendations to evacuate or take shelter, in the case of a toxic vapor release).

PROCEDURE-A	ESTABLISHING THE EMERGENCY OPERATION CENTRE (EOC)		
Task	**Action**		**Status**
1.0	Obtain and/or assign EOC equipment.		
1.1	Communications.		
	A	Telephone lines. (1 Hot line linking Dy. Commissioner of the district)	
	B	Fax lines.	
	C	Radio frequency (as required).	
1.2	Information Display.		
	A	Set of forms (minimum of 5 sets).	
	B	Regional Maps and Charts:	
		i Nautical charts.	
		ii Topographic maps	
	C	Overhead projector (in nominated briefing room).	
	D	Whiteboards.	
1.3	Copy(s) of the JNPA DMP and OSCP.		
1.4	Computer and Printer.		
1.5	Stationary: Markers, Pens, Pencils and A4 white paper.		
1.6	Tables and chairs		
1.7	Order and obtain any items needed (1.1-1.6)		
1.8	Advise reception to direct incoming calls to the EOC.		

Emergency Operating Room Equipment

As a general guideline the following equipment should be catered to

- Flip up of maps should be available-preferably a digitized map on the computer,
- Terminals storing toxic chemicals and terminals storing flammable chemicals,
- Transportation map depicting transportation route for LPG and chemical tankers by road,
- Map showing saltpans (if any),
- Map depicting densely populated areas,
- Map depicting fishing area zones,
- Emergency lights and torches,
- Computer,
- Fax,
- Printer,
- Telephone,
- Portable PA Sets,
- Walkie talkies / mobile telephone,
- Chemical protective suit,
- Loud hailer,
- VHF sets,
- Binoculars,
- Copy of Disaster Management plan, Oil Spill Emergency Plan and Business Continuity Plan,
- Reference books-chemical Encyclopedia,
- Table-seating,
- Chairs,
- Stationery,
- Gas masks with canisters,
- Safety goggles,
- Self-contained breathing apparatus.

Competent Agencies

Table No. 9: Competent agencies for issuing warnings

Disaster	Agencies
Earthquakes	IMD
Floods	Central Water Commission
Cyclones	IMD, Regional Specialized Meteorological Centre (RSMC) – Arabian Sea
Tsunami and Storm Surge	INCOIS

These agencies shall be responsible for keeping track of developments in respect of specific hazards assigned to them and inform the designated authorities/agencies at National, State and District levels about the impending disasters. All these agencies have developed guidelines for early warning of disasters.

Cyclone

Indian Meteorological Department (IMD) has a developed detailed procedure for Four Stage Warning of Cyclone

1) **Pre-Cyclone Watch:** Pre-cyclone watch is an early warning issued about 72 hrs. in advance of the commencement of bad weather. This is issued by the IMD Headquarters to all designated authorities including the Cabinet Secretary and other senior officers of Govt. of India and the Chief Secretaries of concerned Maritime States, media and all Cyclone Warning Centers (CWS) of IMD.

2) **Cyclone Alert:** Cyclone Alert is issued to all designated authorities/Agencies as far as possible, 48 hours before the expected commencement of adverse weather.

3) **Cyclone Warning:** Cyclone warning are issued to all designated Authorities/Agencies including the Chief Secretaries of the maritime States and the District Magistrates/Collectors of the coastal districts and the immediate interior districts expected to be affected by the cyclone. Cyclone Warning is also issued to the designated railway officials and defense personnel. After initial warning , cyclone warning are issued to above officials twice a day by high priority telegrams based on 0830 IST and 1730 IST charts till the weather improves.

4) **Post Landfall Outlook:** Post landfall outlook is issued at least 12 hours in advance of the landfall by concerned CWCs. On the basis of this outlook, the concerned Meteorological Centre will also issue cyclone warnings for the interior areas.

Cyclone Warning Dissemination System (CWDS)

Cyclone Warning Dissemination System (CWDS) receivers have been established in vulnerable coastal areas using INSAT/METSAT. The system is being used extensively on operational basis during cyclone. The cyclone warning message is originated from Area Cyclone Warning Centre (ACWC) Colaba, Mumbai whenever a storm is observed. Warning messages are received in local languages directly by CWDS receivers located in areas likely to be affected by the cyclone.

In addition Cyclone Warning is disseminated through the following means:

a. Police Wireless network
b. Warnings through All India Radio (AIR) Bulletins
c. Television
d. Press Bulletins
e. Aviation Warning
f. Telephone and Fax
g. Telex
h. Telegrams

Tsunami

In the aftermath of the Indian Ocean Tsunami of 26 December 2004, the Ministry of Earth Sciences has set up an Indian Tsunami Early Warning Centre at the Indian National Centre for Ocean Information Services (INCOIS) Hyderabad. The Centre is mandated to provide advance warnings on Tsunamis likely to affect the coastal areas of the country.

Tsunami Warning (RED) contains information about the earthquake and a tsunami evaluation message indicating that tsunami is expected. This is the highest level wherein immediate actions are required to move public to higher grounds. Message also contains information on the travel times and tsunami grade (based on run-up estimates) at various coastal locations.

Tsunami Alert (ORANGE) contains information about the earthquake and a tsunami evaluation message indicating that tsunami is expected. This is the second highest level wherein immediate public evacuation is not required. Public should avoid beaches since strong current are expected. Local officials should be prepared for evacuation if it is upgraded to warning status. Message also contains information on the travel times and tsunami grade at various coastal locations.

Tsunami Watch (YELLOW) contains information about the earthquake and a tsunami evaluation message indicating that tsunami is expected. This is the third highest level wherein immediate public evacuation is not required, Local officials should be prepared for evacuation if it is upgraded to warning status. Message also contains information on the travel times and tsunami grade at various coastal locations.

Tsunami cancellation (GREEN) will be issued if the tsunami warning was issued on the basis of erroneous data or if the warning centre determines from subsequent information that only an insignificant wave has been generated. In addition, tsunami warning may be cancelled on a selective basis when a significant wave that has been generated clearly poses no threat to one or more of the areas the warning centre warns, either because of intervening continents or islands which screen them or because the orientation of the generating area causes the tsunami to be directed away from these areas.

Tsunami All Clear (GREEN) bulletin indicates that the 'Tsunami Threat' is passed and no more dangerous waves are expected.

Flood

Central Water Commission has developed a network of flood forecasting stations and issues Daily Flood Bulletins to all designated Authorities/Agencies of the Central Government and State Governments/ district Administration during the South East Monsoon season for all the major river basins in the following categories:

Category IV:
Low Flood (Water level between Warning Level and Danger Level)

Category III:
Moderate Flood (Water Level below 0.50m. less than HFL and above Danger Level)

Category II:
High Flood (Water Level less than Highest Flood Level but still within 0.50m. of the HFL)

Category I:
Unprecedented Flood (Water Level equal and above Highest Flood Level (HFL))

PUBLIC WARNING

The capabilities and processes the Port has in place to information collection and disseminates warning messages to the stakeholders and all the personnel as to the nature of the hazard, the timing, and the recommended or required protective/preventive actions which are to be implemented by the action group are described in the following sections.

Message content

The message needs to be announced at least in local language which may be for example Evacuate, Assemble etc.

Public Warning System

The various types of warnings through hooters/sirens with indication locally and in control room, depending on the location of emergency as specified below:

- **Siren for declaring Emergency**

  1. On receipt of the information about the Emergency, the control station will authorize CISF at Central Gate Complex to actuate the Emergency Siren as follows: -

  - Siren to be sounded continuously for 30 Seconds with an interval of 5 seconds to be repeated 10 times.

- **Siren declaring Evacuation from the Port area**

  1. On receipt of the orders from the Deputy Conservator or in his absence the Harbour Master the port control room will authorize CISF at Central Gate Complex to actuate the Siren as follows:

  - Siren declaring Evacuation from the Port area: Siren to be sounded for 5 seconds till the area is evacuated by people or for ½ hour whichever is less

- **Siren declaring All Clear and returning to the work**

  1. On receipt of the information from the Deputy Conservator or in his absence Harbour Master the port control room will authorize CISF at Central Gate Complex to actuate the Siren as follows:

  - Continuous ringing of siren for 5 minutes

3.2 During Crisis – This phase includes coordination and immediate response arising out of any crisis situation.

a) Step 4 – Protection

Protection Action

JNPA has a reporting system for the incidents taking place in the Port premises. Regular training programme and mock/fire drills also take place within the port involving the operators.

Prevention/Protection action include:

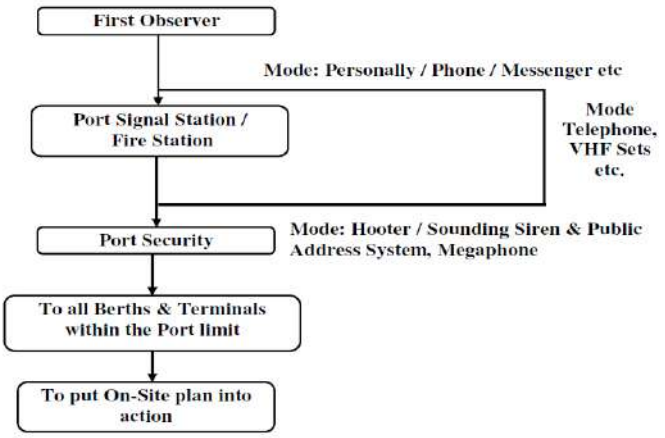
- Passage abort procedures (For navigational channel),
- Passage record keeping,
- Master/Pilot exchange

– Master to Pilot (The Pilot card),
– Pilot to Master (Pilotage Passage plan),
– Master to Pilot (Hazard Checklist- Ship carrying dangerous or polluting goods).

- Patrolling,
- Conduct investigation of the incidents and identify the short-comings and make good of the same,
- Warning Signboards,
- Restricted zones.

Protection Action Implementation Plan

Following is the typical Prevention/Protection action plan.



Action Implementation Plan

b) Step 5 – Response

HAZARD SPECIFIC RESPONSE PLAN

Following potential scenarios have been identified in accordance with the risk assessment for the port. The action flowchart and action plan for each scenario has been prepared in accordance with the Incident Response System (NDMA).

Scenario 1 - Fire/explosion due to LPG leakage at BPCL Liquid cargo jetty during operation – on Ship or Ashore

1. **Precautions:** MSDS, SOP, Berthing and un-berthing procedures and House- keeping. Leaks from LPG pump glands, pipes flanges or pipeline ruptures or from vent emissions due to cargo tank over-pressure or relief valve failure will initially produce vapour. This vapour will not ignite immediately but, if the vapour production is large, there is a hazard of the resultant cold and dense vapour cloud of LPG spreading to a source of ignition before it is diluted below the lower explosive limit. Therefore, in case of release of large quantity of flammable vapour cloud, immediate effort should be directed to eliminate such source of ignition. In such event, eliminate all sources of ignitions i.e. open flames, welding,cutting, operation etc. in the entire port area.

2. **Impact Zone:** Consequence analysis indicates that the LPG (Propane) leak from pipeline would cover approx. 1000 meters for Vapor cloud explosion (VCE) scenario.

3. **Resources required:** Organizational setup enumerated in Figure S1.2.

Figure S1.1: Action Flow Chart

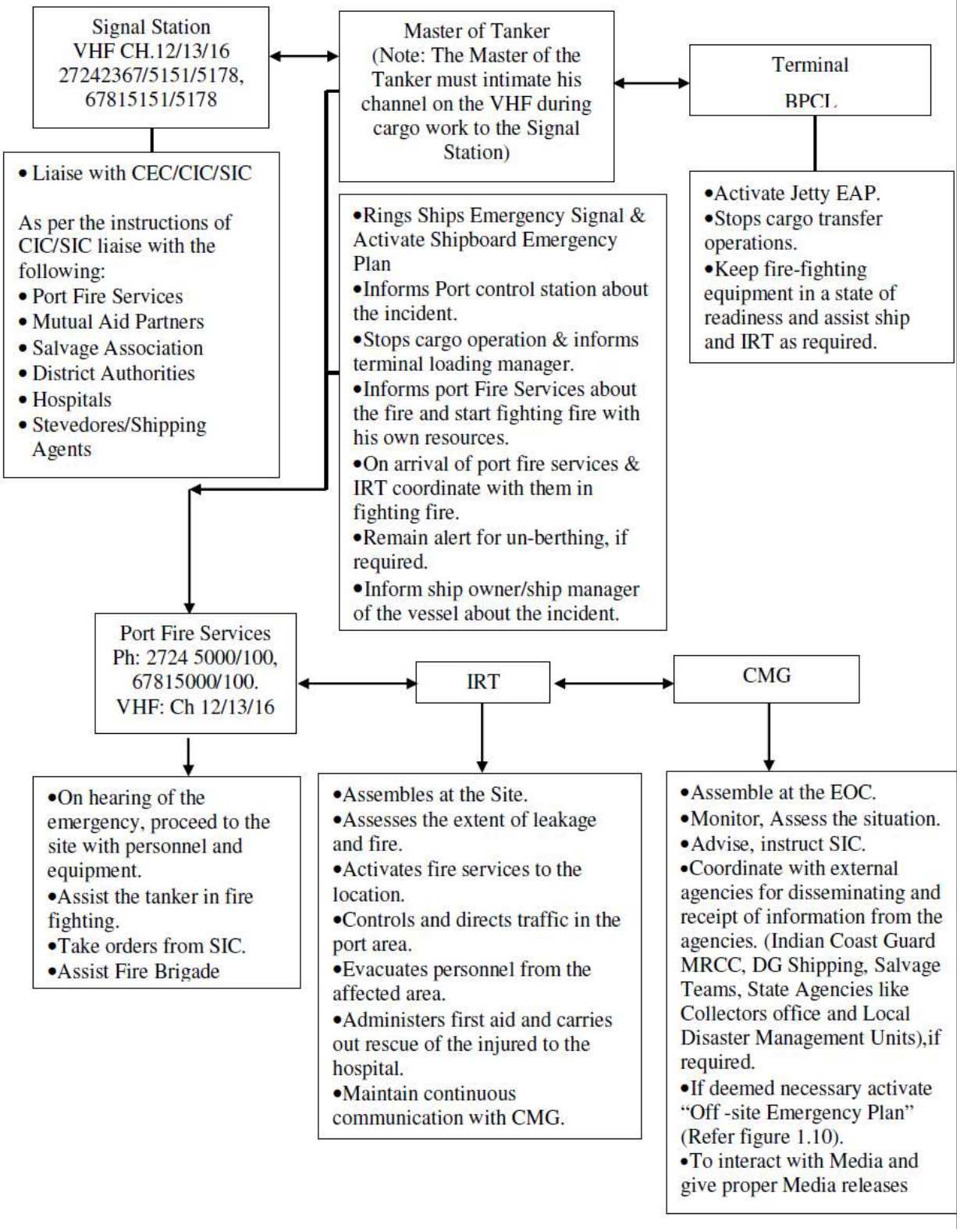
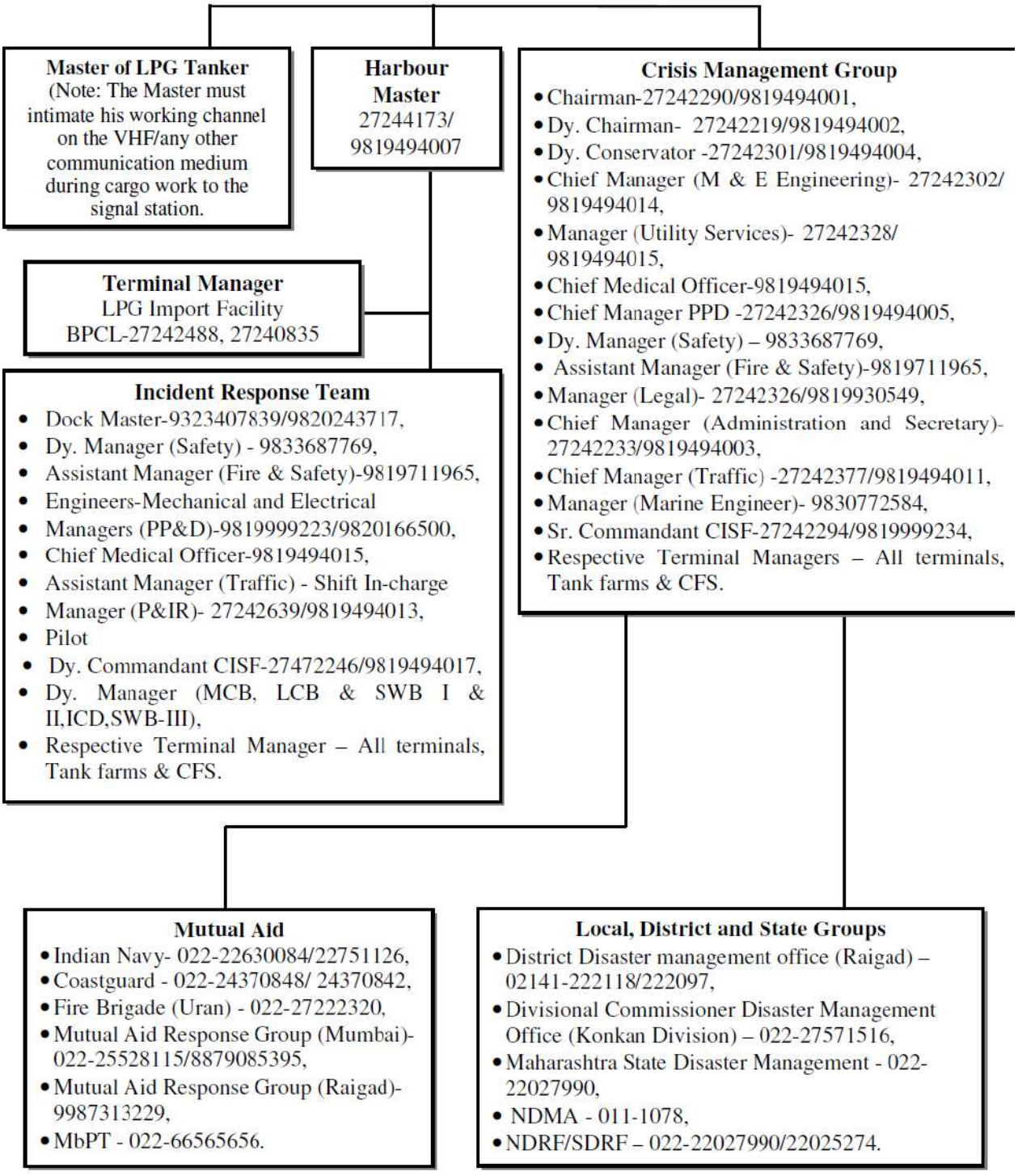


Figure S1.2: Action group



4. Action Plan

The vessel upon berthing at the BPCL jetty will follow standard procedures. However, in a less likely scenario, a leak from the pipeline system may occur at the jetty leading to self-detection by vessel personnel or by the terminal automatic alarm and detection system. Further in a more unlikely situation, due to a possible ignition the leakage might catch fire and lead to explosion. The following actions will be required

A. The Master of the Ship (Alternate: Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate shipboard emergency action plan.	
b. Stop LPG transfer operation (as per SOP of the ship).	
c. Terminal, Vessel in the vicinity and Port should be informed of any incident on the ship without delay.	• BPCL • Port Control Station • Vessels in thevicinity
d. Personnel to remain stand by to disconnect metal arms.	
e. Shall be responsible for fighting the fire with ships own resources as well as with the available support from IRT.	
f. Also, to remain prepared to un-berth the ship to the safe area (high sea).	
g. The siren should be continued till the ship is taken to a safe location as per CIC instructions.	

B. The terminal personnel should

Response Action	Contact
a. Activate Jetty EAP (prepared by the terminal) and informJNPA.	• Port Control Station
b. Shut off isolation valve on LPG pipeline at the berth (action as per SOP of the terminal).	
c. Area should be cordoned off.	
d. Pour Dry Chemical Powder.	
e. Assist IRT and provide all necessary equipment.	• SIC
f. He will direct operation staff. Coordinate with the ship in-charge/C&F agents/stevedores.	

C. Deputy Conservator (Alternate: Harbour Master) should

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ DY. Chairman.	• Chairman • Dy. Chairman
e. Assess the condition of site and of potential affected area and take decision on evacuation in consultation with SIC.	• SIC
f. Be in constant touch with District and Local Administration for rescue and relief operation.	
g. Terminate the response and debrief before allowing normal operation.	

D. The Port Control Station

Response Action	Contact
a. Gather information related to the weather conditions. Monitor the wind directions and accordingly convey the message to CIC/SIC and Fire & Safety Officers.	• CIC • SIC • F&SO
b. Liaise with Master of the Vessel/Pilot.	• Master of the vessel • Pilot
c. Communication to be maintained on VHF channel-13.	
d. Notify to CIC, SIC and the vessels moving into, through and inside the port. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC
e. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Navy • Coastguard • Stakeholders
f. Notify the information to the owner of the vessel as per the instruction of CIC/SIC/ Master of the Vessel.	

E. The Fire-fighting Personnel should

Response Action	Contact
a. Raise Alarm (siren)	
b. Start the pumps as per the requirement	
c. Use water sprays and portable nozzles to maintain curtain and to disperse LPG vapors.	
d. Ensure the gas leak has been stopped. Allow the gas to burn rather than extinguishing.	
e. Open the water curtain valve to protect shore installations from heat radiation.	
f. Inform fire officers to arrange for fire float fire-fighting tug and Marine Engineer to arrange for tugs , as required	• Fire Officer • Marine Engineer
g. Ensure all the ignition sources in the vicinity are extinguished if fire has not occurred.	
h. If the fire is under control and extinguished, give all clear signal	

F. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the Master of the Tanker, Berth Manager and Terminal Manager.	Dock Master
		Conduct initial Briefing.	
		Report the situation to the CIC/CMG and assist CIC in assessing the incident.	
		Initiate DMP.	
		Alert vessels within the vicinity.	
		Assess the condition of site and of potential affected area and take decision on evacuation in consultation with CIC.	
		Extend all necessary help to the Master of the ship to fight the fire.	
		Instruct the Asst. Manager (Fire and Safety) to keep the firefighting installation in a state of readiness & activate if required.	
		Instruct Dock Master/Marine Engineer(s) to keep tugs ready for firefighting.	
		Coordinate with all functional heads to take actions.	

Designated Officer	Role	Duties	Alternate Officer
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC /SIC.	Duty Supervisor
		Organize tugs, mooring boats and Pilots for rescue.	
		Hire additional crafts, asnecessary.	
		Maintain Log of events.	
Asst. Manager (Fire and Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Lead the fire-fighting team and mobilize fire tenders, men & fire- fighting equipment to the scene & extend all necessary support to the Master of the vessel/Terminal Manager/Berth Manager for fire- fighting.	
		Inform SIC for arrangement of any additional equipment as required.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders from the SIC.	Safety Inspector
		Ensure responsible actions for containing the run off fire water and other water from the damaged units.	
		Assist in evacuation of the personnel to the assembly point or as directed by SIC.	
		Conduct clean- up work during and after the emergency as quick as possible.	
Sr. Commandant - CISF	Security and Evacuation	Shall take orders from the SIC.	Dy. Commandant -CISF
		Cordon off the area.	
		Controls & Directs gate security and traffic in the area.	
		Shall facilitate evacuation, transport, first aid and rescue of personnel from the scene at the time of emergency.	
		Control the entry of unauthorized persons and vehicles.	
		Check for entry of emergency vehicles.	
		Liaise with the Police authorities.	
		Responsible for the head count of the personnel.	
Chief Manager (Traffic)	Traffic Coordinator	Shall take orders from SIC and assist Manager LCB.	Asst. Manager (Traffic)
		Submits consolidated list of dangerous goods in port including tankers in port and tank farms in port area.	
		Regulate the traffic in the area.	

Designated Officer	Role	Duties	Alternate Officer
Chief Manager (Port, Planning and Development)	Civil Coordinator	Inform MPCB and other environmental agencies and take necessary guidance.	Manager(I,II)
		Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	
		Shall be responsible to carry out urgent civil works as required.	
Chief Manager (Mechanical & Electrical)	In charge of Electrical Installation	Shall be responsible for uninterrupted electrical supply to vital equipment and utility at the berth.	Asst. Engineer
		Shall remain alert on duty for any electrical isolation of equipment during emergency.	
		Liaise with SIC and assist Terminal Manager.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
		Shall coordinate with the local hospitals.	
Duty Pilot	In Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue.	Sr. Dy. Manager (Marine Engg.)
		Hire additional crafts as necessary.	

Scenario 2 - Fire due to leakage of POL/Chemical at BPCL Liquid Cargo Jetty – on ship or ashore SWB (NSDT)

1. **Precautions:** MSDS, SOP of terminal and berthing and un-berthing procedure.

2. **Impact Zone:** Consequence analysis indicates that the MS leak from pipeline would coverapprox. 1350 meters for Vapor cloud explosion (VCE) scenario.

3. **Resources required:** Organizational setup enumerated in Figure S2.2.

Figure S2.1: Action Flow Chart

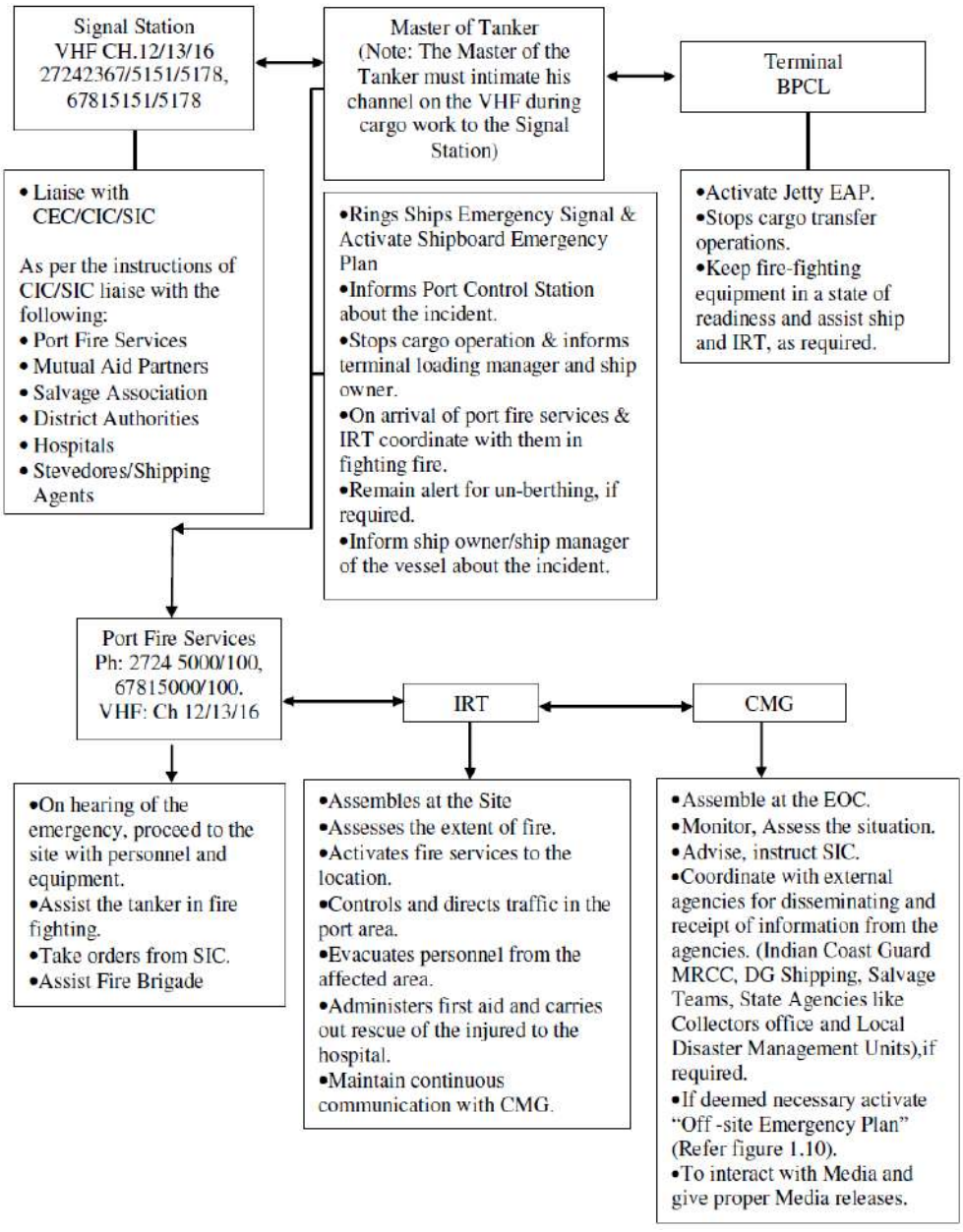
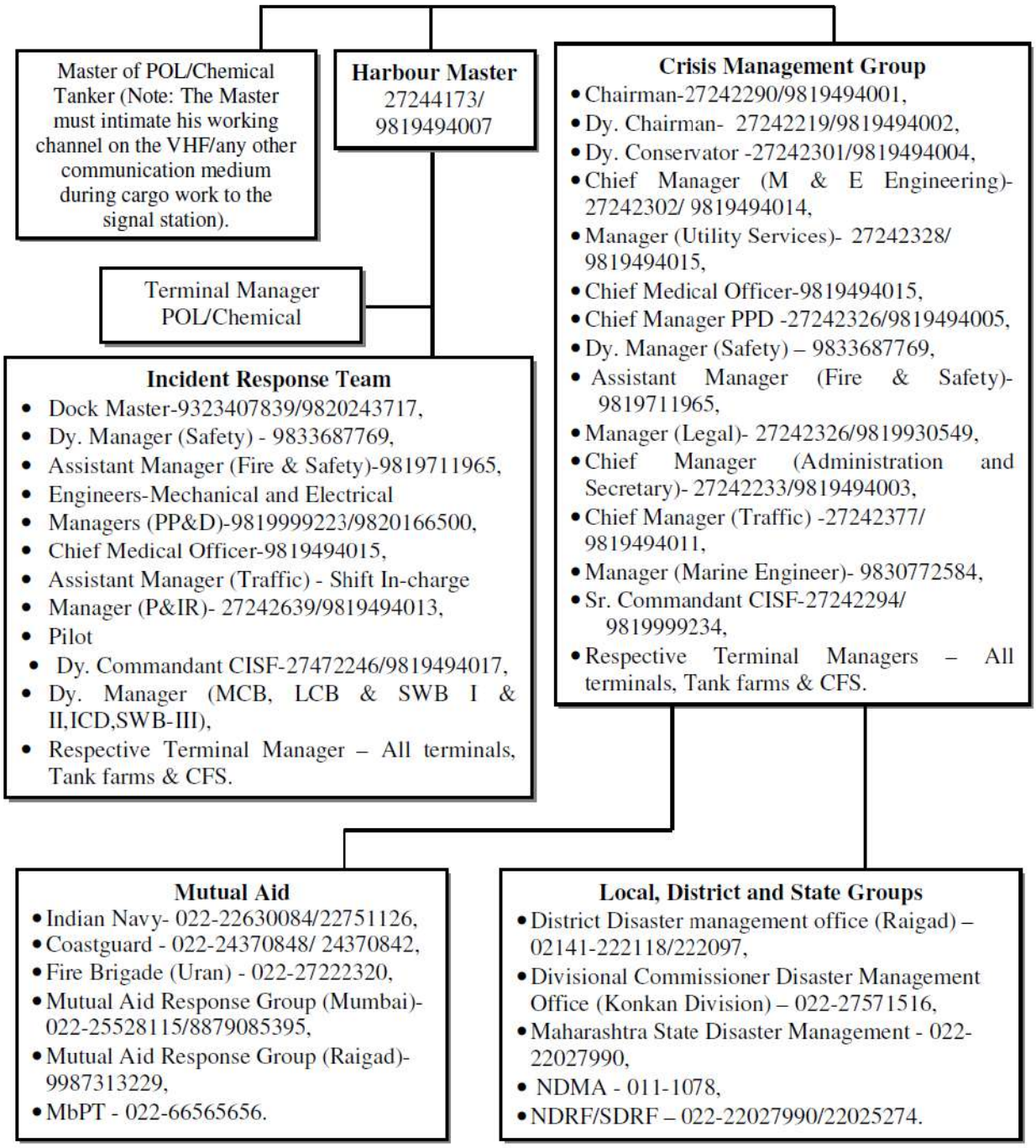


Figure S2.2: Action group



4. Action Plan

The vessel upon berthing terminal will follow standard procedures. However, in a lesslikely scenario a leak from the pipeline system may occur at the jetty leading to self- detection by vessel personnel or by the terminal automatic alarm system. Further in a more unlikely situation due to a possible ignition the leakage might catch fire and leading to explosion. The following action will be required

A. The Master of the Ship (Alternate: Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate ship board emergency action plan.	
b. Stop POL/Chemical transfer operation (as per SOP of the ship).	
c. Terminal, Vessel in the vicinity and Port should be informed of any incident on the ship without delay.	• Terminal • Port Control Station
d. Personnel to remain stand by to disconnect hoses.	
e. Shall be responsible for fighting the fire with ships own resources as well as with the available support from IRT.	
f. Also, to remain prepared to un-berth the ship to the safe area (high sea).	
g. The siren should be continued till the ship is taken to a safe location as per CIC instructions.	

B. The terminal persons tasked with POL/Chemical cargo operations at the Jetty should

Response Action	Contact
a. Activate Jetty EAP (prepared by the terminal) and inform JNPA.	• Port Control Station
b. Shut off isolation valve on POL/Chemical pipeline at the berth (action as per SOP of the terminal).	
c. Area should be cordoned off.	
d. Pour foam/dry chemical powder on POL/Chemical spillage to reduce rate of vaporization.	
e. Assist IRT and provide all necessary equipment.	
f. He will direct operation staff. Coordinate with the ship in-charge/C&F agents/stevedores.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Assess the condition of site and of potential affected area and take decision on evacuation in consultation with SIC.	• SIC
f. Be in constant touch with District and Local Administration for rescue and relief operation.	
g. Terminate the response and debrief before allowing normal operation.	

D. The Port Control Station

Response Action	Contact
a. Gather information related to the weather conditions. Monitor the wind directions and accordingly convey the message to CIC/SIC and F& SO.	• CIC • SIC • F&SO
b. Liaise with Master of the Vessel/Pilot.	• Master of the Vessel • Pilot
c. Communication to be maintained on VHF channel-13.	
d. Notify to CIC, SIC and the vessels moving into, through and inside the port. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC
e. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Navy • Coastguard • Stakeholders
f. Notify the information to the owner of the vessel as per the instruction of CIC/SIC/ Master of the Vessel.	

E. The Fire-fighting personnel should

Response Action	Contact
a. Raise Alarm (siren)	
b. Start the pumps as per the requirement	
c. Use water sprays and portable nozzles to maintain curtain.	
d. Open the valves of the monitors and direct the jet on the seat of fire.	
e. Inform fire officers to arrange for fire-fighting tug and Marine Engineer to arrange for tugs , as required	• F&SO • Marine Engineer
f. In case of fire onboard assist Master in fighting fire as per Masters Instructions.	
g. Ensure all the ignition sources in the vicinity are extinguished if fire has not occurred.	
h. If the fire is under control and extinguished, give all clear signal.	

F. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the Master of the Tanker, Berth Manager and Terminal Manager.	Dock Master
		Conduct initial Briefing.	
		Report the situation to the CIC/CMG and assist CIC in assessing the incident.	
		Initiate DMP.	
		Alert vessels within the vicinity.	
		Assess the condition of site and of potential affected area and take decision on evacuation inconsultation with CIC.	
		Extend all necessary help to the Master of the ship to fight the fire.	
		Instruct the Asst. Manager (Fire and Safety) to keep the firefighting installation in a state of readiness & activate if required.	
		Instruct Dock Master/ Marine Engineer(s) to keep tugs ready for firefighting.	
		Coordinate with all functional heads to take actions.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC/SIC.	Duty Supervisor

Designated Officer	Role	Duties	Alternate Officer
		Responsible for organizing tugs, mooring boats and pilots for combating the fire and rescue.	
		Hire additional crafts as necessary.	
		Maintain Log of events.	
Tank Terminal Manager	Cargo Work	Shall be responsible of shutting down of cargo operation & coordinating with JNPA and rendering necessary assistance to the SIC by providing additional firefighting & emergency equipment as required.	Assistant Terminal Manager
Asst. Manager (Fire and Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Lead the firefighting team and mobilize fire tenders, men & fire- fighting equipment to the scene & extend all necessary support to the Master of the vessel/Terminal Manager/Berth Manager for firefighting.	
		Inform SIC for arrangement of any additional equipment as required.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders from the SIC.	Safety Inspector
		Ensure responsible actions for containing the run off fire water and other water from the damaged units.	
		Assist in evacuation of the personnel to the assembly point or as directed by SIC.	
		Conduct clean- up work during and after the emergency as quick as possible.	
Sr. Commandant -CISF	Security and Evacuation	Shall take orders from the SIC.	Dy. Commandant -CISF
		Cordon off the area.	
		Controls & Directs gate security and traffic in the area.	
		Shall facilitate evacuation, transport, first aid and rescue of personnel from the scene at the time of emergency.	
		Control the entry of unauthorized persons and vehicles.	
		Check for entry of emergency vehicles.	
		Liaise with the Police authorities.	
		Responsible the head count of the personnel.	
Chief Manager (Traffic)	Traffic Coordinator	Shall take orders from SIC and assist Manager LCB.	Asst. Manager (Traffic)
		Submits consolidated list of dangerous goods in port including tankers in port and tank farms in port area.	

Designated Officer	Role	Duties	Alternate Officer
		Regulate the traffic in the area.	
Chief Manager (Port, Planning and Development)	Civil Coordinator	Inform MPCB and other environmental agencies and take necessary guidance.	Manager (I, II)
		Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	
		Shall be responsible to carry out urgent civil works as required.	
Chief Manager (Mechanical & Electrical)	In charge of Electrical Installation	Shall be responsible for uninterrupted electrical supply to vital equipment and utility at the berth.	Asst. Engineer
		Shall remain alert on duty for any electrical isolation of equipment during emergency.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
		Shall coordinate with the local hospitals.	
Duty Pilot	In Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue.	Sr. Dy. Manager (Marine Engg.)
		Hire additional crafts as necessary.	

Scenario 3 - Toxic gas (Liquid Ammonia) leak at BPCL Liquid Cargo Jetty during operation – on Ship or Ashore

1. **Precautions:** MSDS, SOP of terminal and berthing and un-berthing procedures. Stay upwind and wear positive-pressure breathing apparatus and full protective clothing, as necessary.

2. **Impact Zone:** Consequence analysis indicates that the Ammonia leak from pipeline would cover to the 9 KM for toxic dispersion with IDLH level of 300 ppm.

3. **Resources required:** Organizational setup enumerated in Figure S3.2.
   Important: Trained medical personnel and fire fighters as ammonia is toxic.

Figure S3.1: Action Flow Chart

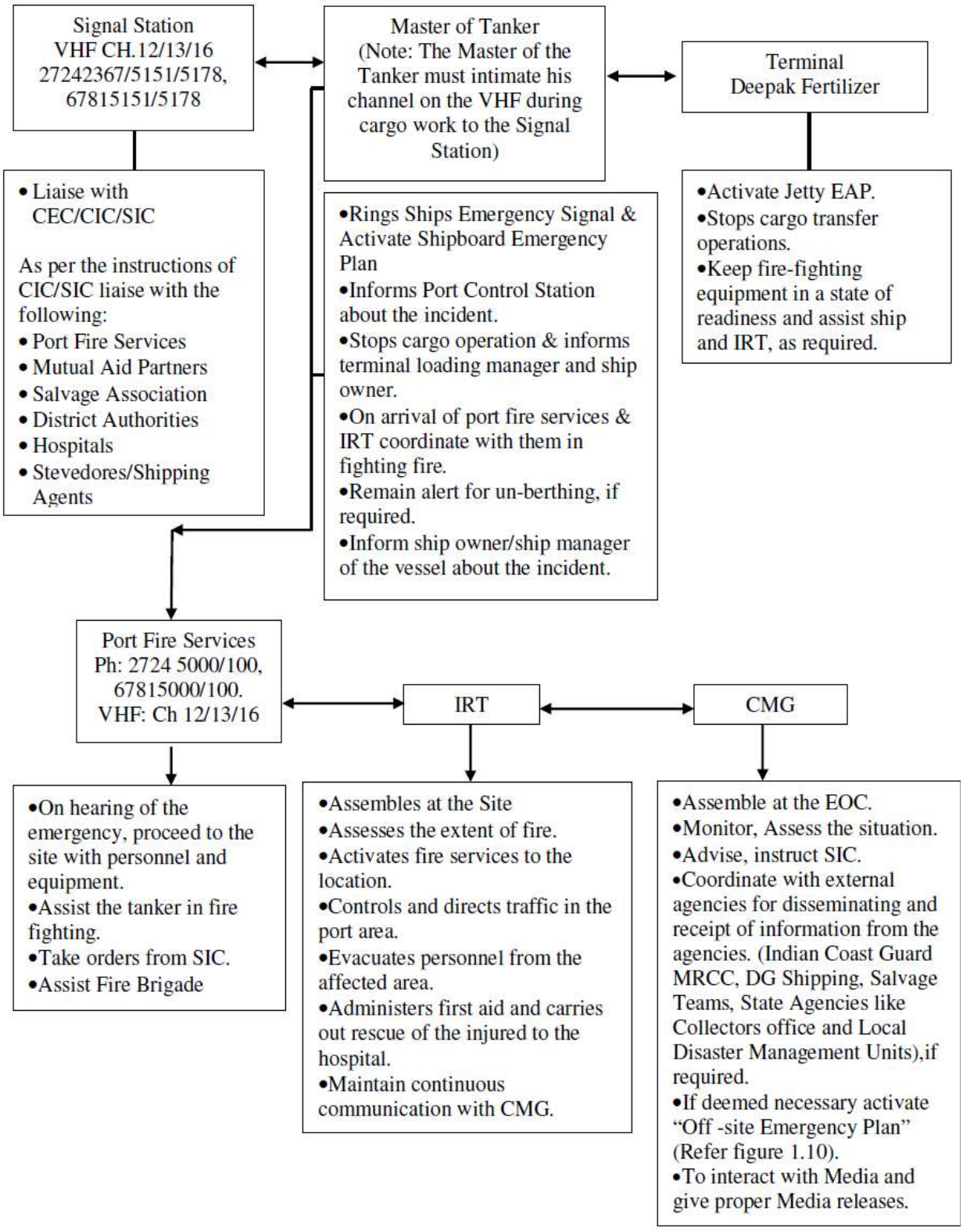
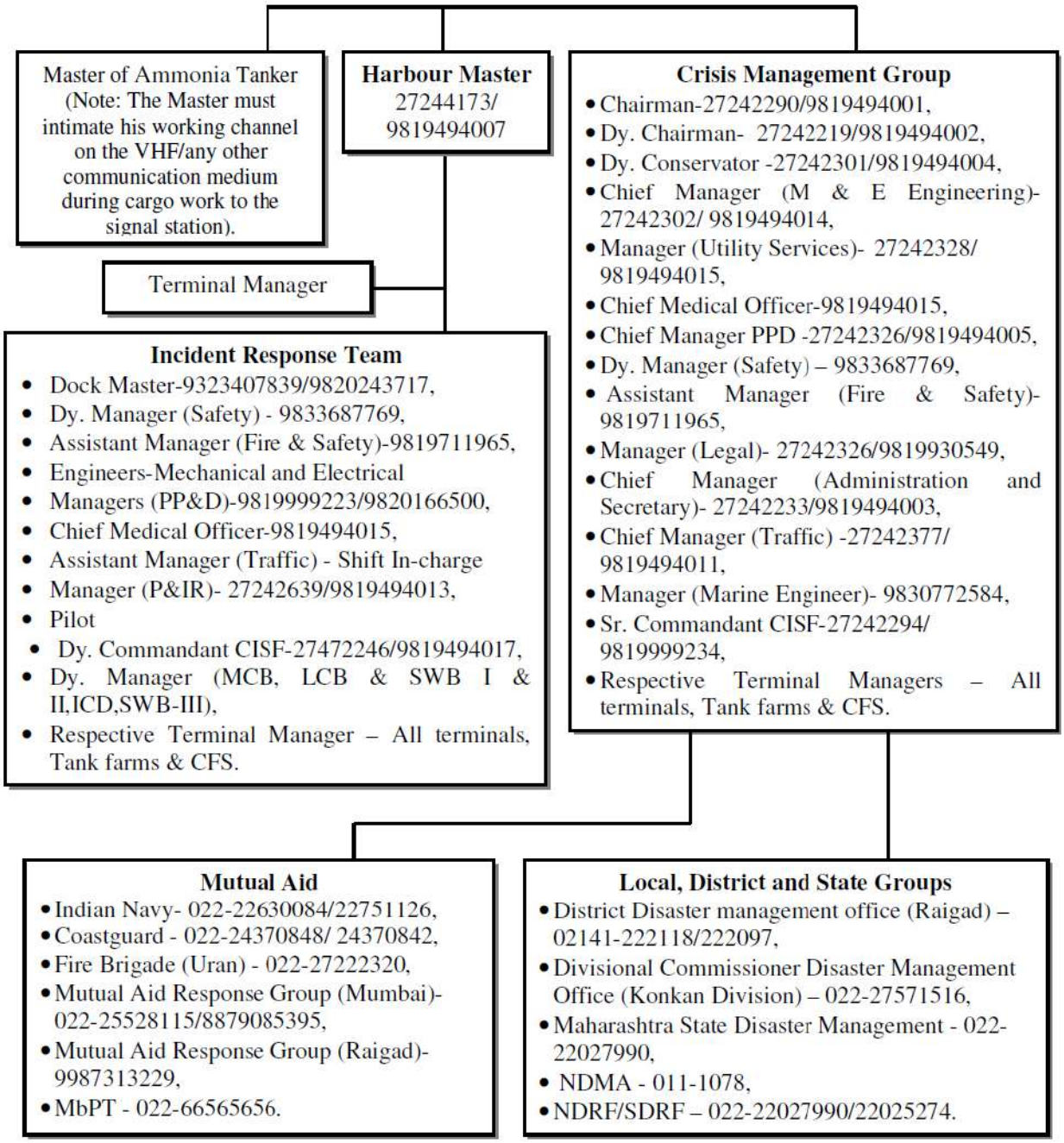


Figure S3.2: Action group



4. Action Plan

The vessel upon berthing terminal will follow standard procedures. However, in a lesslikely scenario a leak from the pipeline system may occur at the jetty leading to self- detection by vessel personnel or by the terminal automatic alarm system. The following action will be required

Spill handling: Evacuate and restrict person's not wearing protective equipment fromarea of spill or leak until cleanup is complete. Remove all ignition sources. Stop the flow of gas if it can be done safely. Stay upwind; keep out of low areas. Wear positivepressure breathing apparatus and full protective clothing.

A. The Master of the Ship (Alternate: Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate shipboard emergency action plan.	
b. Stop Ammonia transfer operation (as per SOP of the ship).	
c. Terminal, Vessel in the vicinity and Port should be informed of any incident on the ship without delay.	• Terminal • Vessel in the vicinity • Port Control Station
d. Personnel to remain stand by to disconnect metal arms;	
e. Shall be responsible to arrest the leak and for fighting the fire with ships own resources as well as with the available support from IRT.	
f. Also, to remain prepared to un-berth the ship to the safe area (high sea).	
g. The siren should be continued till the ship is taken to a safe location as per CIC instructions.	

B. The terminal persons tasked with Ammonia cargo operations at the Jetty should

Take personal precautions, protective equipment and follow emergency procedures. Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Environmental precautions: Prevent further leakage or spillage if safe to do so.

Contain spillage, and then collect with an electrically protected vacuum cleaner (vehicle mounted in some cases) or by wet-brushing and place in container for disposal.

Response Action	Contact
a. Activate Jetty EAP (prepared by the terminal) and informJNPA.	• Port Control Station
b. Shut off isolation valve on ammonia pipeline at the berth (action as per SOP of the terminal).	

Response Action	Contact
c. Area should be cordoned off.	
d. Assist IRT and provide all necessary equipment.	
e. He will direct operation staff. Coordinate with the ship in-charge/C&F agents/stevedores.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Consult with Chairman / Dy. Chairman and decide on clearing of ships in close proximity to the incident location or to sail the ammonia tanker to the higher seas and evacuating the people from the likely affected zone.	
f. Take decision on evacuation in consultation with SIC.	• SIC
g. Be in constant touch with District and Local Administration for rescue and relief operation.	
h. Terminate the response and debrief before allowing normal operation.	

D. The Port Control Station

Response Action	Contact
a. Gather information related to the weather conditions. Monitor the wind directions and accordingly convey the message to Master of the vessel, CIC/SIC and F& SO.	• Master of the vessel, CIC • SIC • F& SO
b. Liaise with Master of the Vessel/Pilot.	• Master of the Vessel • Pilot
c. Communication to be maintained on VHF channel-13.	•
d. Notify to CIC, SIC and the vessels moving into, through and inside the port. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC
e. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Navy • Coastguard • Stakeholders
f. Notify the information to the owner of the vessel as per the instruction of CIC/SIC/ Master of the Vessel.	

E. The Fire-fighting Personnel should

Response Action	Contact
a. Raise Alarm (siren).	
b. Start the pumps as per the requirement.	
c. Use water sprays and portable nozzles to maintain curtain and dilution.	
d. Open the valves of the monitors and direct the jet on the seat of fire, in case of fire.	
e. Inform fire officers to arrange for fire-fighting tug and Marine Engineer to arrange for tugs, as required.	• F&SO • Marine Engineer
f. In case of leakage/fire onboard assist Master in arresting the leak/diluting the vapour/ fighting fire as per Masters Instructions.	
g. Announce in mobile van with PA system in the effecting zones to evacuate the zone. Ensure complete evacuation and report to the EOC.	
h. Ensure all the ignition sources in the vicinity is extinguished if fire has not occurred.	
i. If the situation is under control, give all clear signals.	

F. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the Master of the Tanker, Berth Manager and Terminal Manager.	Dock Master
		Conduct initial Briefing.	
		Report the situation to the CIC/CMG and assist CIC in assessing the incident.	
		Initiate DMP.	
		Alert vessels within the vicinity.	
		Shall assess and decide on the evacuation of the personnel considering the direction of wind and dispersion and will instruct Safety Officer and CISF to carry out the evacuation in a safe manner.	
		He will extend all necessary help to the Master of the ship to fight the fire.	
		Instruct the Asst. Manager (Fire and Safety) to keep the fire- fighting installation in a state of readiness & activate if required to fight fire or for disperse the vapour cloud.	

Designated Officer	Role	Duties	Alternate Officer
		Instruct Dock Master/ Marine Engineer(s) to keep tugs ready for firefighting.	
		Coordinate with all functional heads to take actions.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC /SIC.	Duty Supervisor
		Responsible for organizing tugs, mooring boats and Pilots for combating the fire and rescue.	
		Hire additional crafts as necessary.	
		Maintain Log of events.	
Terminal Managers- BPCL and Deepak Fertilizer	Cargo Work	Shall be responsible of shutting down of cargo operation & coordinating with JNPA and rendering necessary assistance to the SIC by providing additional emergency equipment as required.	Assistant Terminal Manager
Asst. Manager (Fire and Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Lead the firefighting team and mobilize fire tenders, men & fire- fighting equipment to the scene & extend all necessary support to the Master of the vessel/Terminal Manager/Berth Manager for firefighting.	
		Inform SIC for arrangement of any additional equipment as required.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders from SIC.	Safety Inspector
		Assist in evacuation of the personnel to the assembly point or as directed by SIC.	
Sr. Commandant -CISF	Security and Evacuation	Shall take orders from the SIC.	Dy. Commandant-CISF
		Cordon off the area.	
		Controls & Directs gate security and traffic in the area.	
		Shall facilitate evacuation, transport, first aid and rescue of personnel from the scene at the time of emergency.	
		Control the entry of unauthorized persons and vehicles.	
		Check for entry of emergency vehicles.	
		Liaise with the Police authorities.	
		Responsible the head count of the personnel.	

Designated Officer	Role	Duties	Alternate Officer
Chief Manager (Traffic)	Traffic Coordinator	Shall take orders from SIC and assist berth Manager.	Asst. Manager (Traffic)
		Submits consolidated list of dangerous goods in port including tankers in port and tank farms in port area.	
		Regulate the traffic in the area.	
Chief Manager (Port, Planning and Development)	Civil Coordinator	Inform MPCB and other environmental agencies and take necessary guidance.	Manager(I, II)
		Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	
		Shall be responsible to carry out urgent civil works as required.	
Chief Manager (Mechanical &Electrical)	In charge of Electrical Installation	Shall be responsible for uninterrupted electrical supply to vital equipment and utility at the berth.	Asst. Engineer
		Shall remain alert on duty for any electrical isolation of equipment during emergency.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
		Shall coordinate with the local hospitals.	
Duty Pilot	In Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue.	Sr. Dy. Manager (Marine Engg.)
		Hire additional crafts as necessary.	

Scenario 4 - Toxic gas (Acrylonitrile) leak at NSDT during operation – on Ship or Ashore

1. **Precautions:** MSDS, SOP of terminal and berthing and un-berthing procedures. Stay upwind and wear positive-pressure breathing apparatus and full protective clothing, as necessary.

2. **Impact Zone:** Consequence analysis indicates that the Acrylonitrile leak from pipeline would cover to the 5 KM for toxic dispersion with IDLH level of 85 ppm.

3. **Resources required:** Organizational setup enumerated in Figure S4.2.
   Important: Trained medical personnel and fire fighters as Acrylonitrile is toxic.

Figure S4.1: Action Flow Chart

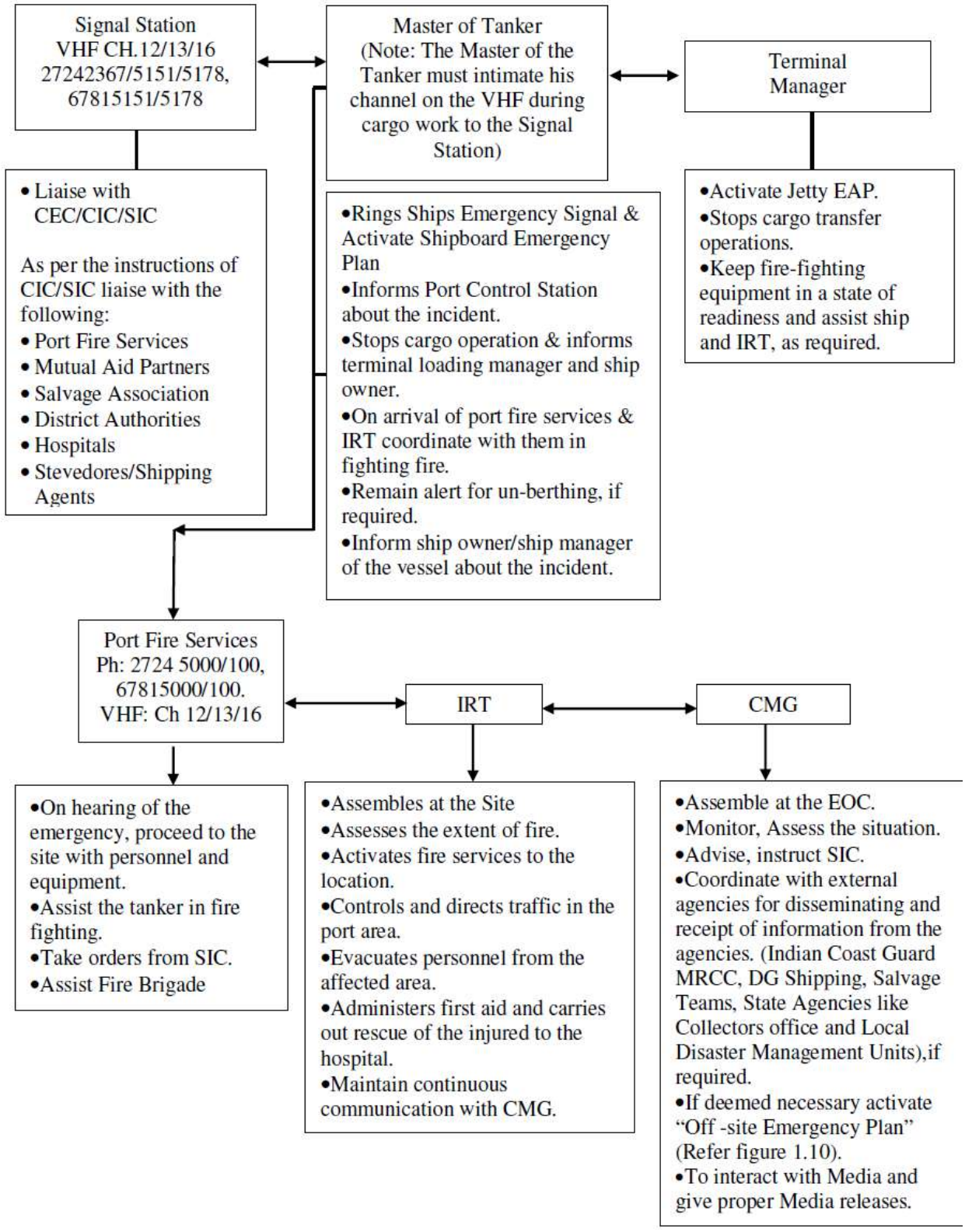
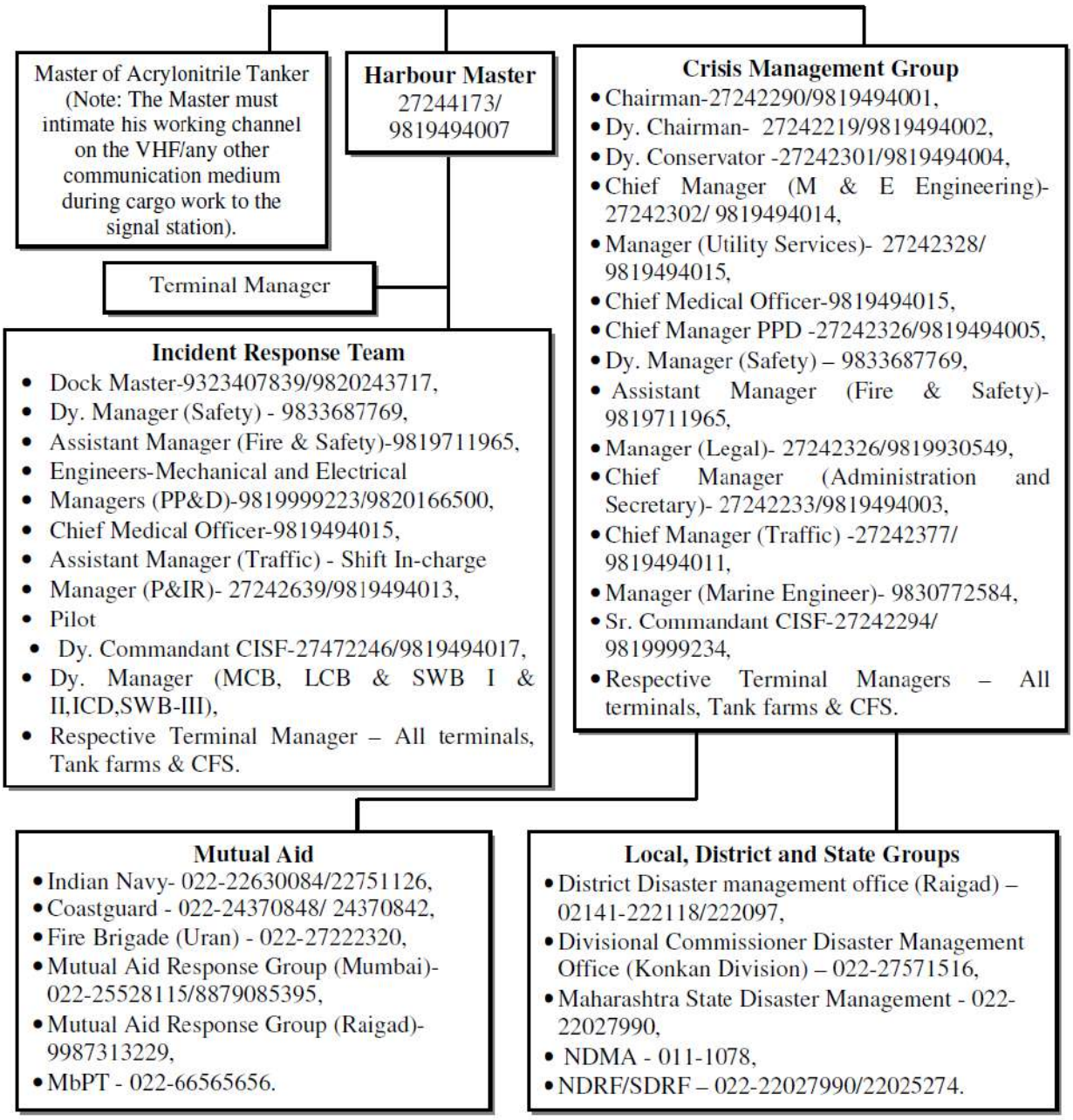


Figure S4.2: Action group



4. Action Plan

The vessel upon berthing terminal will follow standard procedures. However, in a lesslikely scenario a leak from the pipeline system may occur at the jetty leading to self- detection by vessel personnel or by the terminal automatic alarm system. The following action will be required

Spill handling: Evacuate and restrict person's not wearing protective equipment fromarea of spill or leak until cleanup is complete. Remove all ignition sources. Stop the flow of gas if it can be done safely. Stay upwind; keep out of low areas. Wear positivepressure breathing apparatus and full protective clothing.

A. The Master of the Ship (Alternate: Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate shipboard emergency action plan.	
b. Stop transfer operation (as per SOP of the ship).	
c. Terminal, Vessel in the vicinity and Port should be informed of any incident on the ship without delay.	• Terminal • Vessel in the vicinity • Port Control Station
d. Personnel to remain stand by to disconnect metal arms;	
e. Shall be responsible to arrest the leak and for fighting the fire with ships own resources as well as with the available support from IRT.	
f. Also, to remain prepared to un-berth the ship to the safe area (high sea).	
g. The siren should be continued till the ship is taken to a safe location as per CIC instructions.	

B. The terminal persons tasked with cargo operations at the berth should

Take personal precautions, protective equipment and follow emergency procedures. Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. Environmental precautions: Prevent further leakage or spillage if safe to do so.
Contain spillage, and then collect with an electrically protected vacuum cleaner (vehicle mounted in some cases) or by wet-brushing and place in container for disposal.

Response Action	Contact
a. Activate Jetty EAP (prepared by the terminal) and informJNPA.	• Port Control Station
b. Shut off isolation valve on pipeline at the berth (action as per SOP of the terminal).	
c. Area should be cordoned off.	

Response Action	Contact
d. Assist IRT and provide all necessary equipment.	
e. He will direct operation staff. Coordinate with the ship in-charge/C&F agents/stevedores.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Consult with Chairman / Dy. Chairman and decide on clearing of ships in close proximity to the incident location or to sail the tanker to the higher seas and evacuating the people from the likely affected zone.	
f. Take decision on evacuation in consultation with SIC.	• SIC
g. Be in constant touch with District and Local Administration for rescue and relief operation.	
h. Terminate the response and debrief before allowing normal operation.	

D. The Port Control Station

Response Action	Contact
a. Gather information related to the weather conditions. Monitor the wind directions and accordingly convey the message to Master of the vessel, CIC/SIC and F& SO.	• Master of the vessel, CIC • SIC • F& SO
b. Liaise with Master of the Vessel/Pilot.	• Master of the Vessel • Pilot
c. Communication to be maintained on VHF channel-13.	•
d. Notify to CIC, SIC and the vessels moving into, through and inside the port. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC
e. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Navy • Coastguard • Stakeholders
f. Notify the information to the owner of the vessel as per the instruction of CIC/SIC/ Master of the Vessel.	

E. The Fire-fighting Personnel should

Response Action	Contact
a. Raise Alarm (siren).	
b. Start the pumps as per the requirement.	
c. Use water sprays and portable nozzles to maintain curtain and dilution.	
d. Open the valves of the monitors and direct the jet on the seat of fire, in case of fire.	
e. Inform fire officers to arrange for fire-fighting tug and Marine Engineer to arrange for tugs, as required.	• F&SO • Marine Engineer
f. In case of leakage/fire onboard assist Master in arresting the leak/diluting the vapour/ fighting fire as per Masters Instructions.	
g. Announce in mobile van with PA system in the effecting zones to evacuate the zone. Ensure complete evacuation and report to the EOC.	
h. Ensure all the ignition sources in the vicinity is extinguished if fire has not occurred.	
i. If the situation is under control, give all clear signals.	

F. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the Master of the Tanker, Berth Manager and Terminal Manager.	Dock Master
		Conduct initial Briefing.	
		Report the situation to the CIC/CMG and assist CIC in assessing the incident.	
		Initiate DMP.	
		Shall assess and decide on the evacuation of the personnel considering the direction of wind and dispersion and will instruct Safety Officer and CISF to carry out the evacuation in a safe manner.	
		Alert vessels within the vicinity. He will extend all necessary help to the Master of the ship to fight the fire.	
		Instruct the Asst. Manager (Fire and Safety) to keep the fixed. Fire-fighting installation in a state of readiness & activate if required to fight fire or for disperse the vapour cloud.	

Designated Officer	Role	Duties	Alternate Officer
		Instruct Dock Master/ Marine Engineer(s) to keep tugs ready for firefighting.	
		Coordinate with all functional heads to take actions.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC /SIC.	Duty Supervisor
		Responsible for organizing tugs, mooring boats and Pilots for combating the fire and rescue.	
		Hire additional crafts as necessary.	
		Maintain Log of events.	
Terminal Manager	Cargo Work	Shall be responsible of shutting down of cargo operation & coordinating with JNPA and rendering necessary assistance to the SIC by providing additional emergency equipment as required.	Assistant Terminal Manager
Asst. Manager (Fire and Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Lead the firefighting team and mobilize fire tenders, men & fire- fighting equipment to the scene & extend all necessary support to the Master of the vessel/Terminal Manager/Berth Manager for firefighting.	
		Inform SIC for arrangement of any additional equipment as required.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders from SIC.	Safety Inspector
		Assist in evacuation of the personnel to the assembly point or as directed by SIC.	
Sr. Commandant - CISF	Security and Evacuation	Shall take orders from the SIC.	Dy. Commandant-CISF
		Cordon off the area.	
		Controls & Directs gate security and traffic in the area.	
		Shall facilitate evacuation, transport, first aid and rescue of personnel from the scene at the time of emergency.	
		Control the entry of unauthorized persons and vehicles.	
		Check for entry of emergency vehicles.	
		Liaise with the Police authorities.	
		Responsible the head count of the personnel.	

Designated Officer	Role	Duties	Alternate Officer
Chief Manager (Traffic)	Traffic Coordinator	Shall take orders from SIC and assist berth Manager. Submits consolidated list of dangerous goods in port including tankers in port and tank farms in port area. Regulate the traffic in the area.	Asst. Manager (Traffic)
Chief Manager (Port, Planning and Development)	Civil Coordinator	Inform MPCB and other environmental agencies and take necessary guidance.	Manager (I, II)
		Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	
		Shall be responsible to carry out urgent civil works as required.	
Chief Manager (Mechanical & Electrical)	In charge of Electrical Installation	Shall be responsible for uninterrupted electrical supply to vital equipment and utility at the berth.	Asst. Engineer
		Shall remain alert on duty for any electrical isolation of equipment during emergency.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
		Shall coordinate with the local hospitals.	
Duty Pilot	In Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue.	Sr. Dy. Manager (Marine Engg.)
		Hire additional crafts as necessary.	

Scenario 5 - Corrosive Acid - Leakage (Phosphoric acid) at BPCL Liquid Cargo Jettyduring operation – on Ship or Ashore

1. **Precautions:** MSDS, SOP of terminal and berthing and un-berthing procedures.
2. **Impact Zone:** Respective Jetty.
3. **Resources required:** Organizational setup enumerated in Figure S5.2.

Figure S5.1: Action Flow Chart

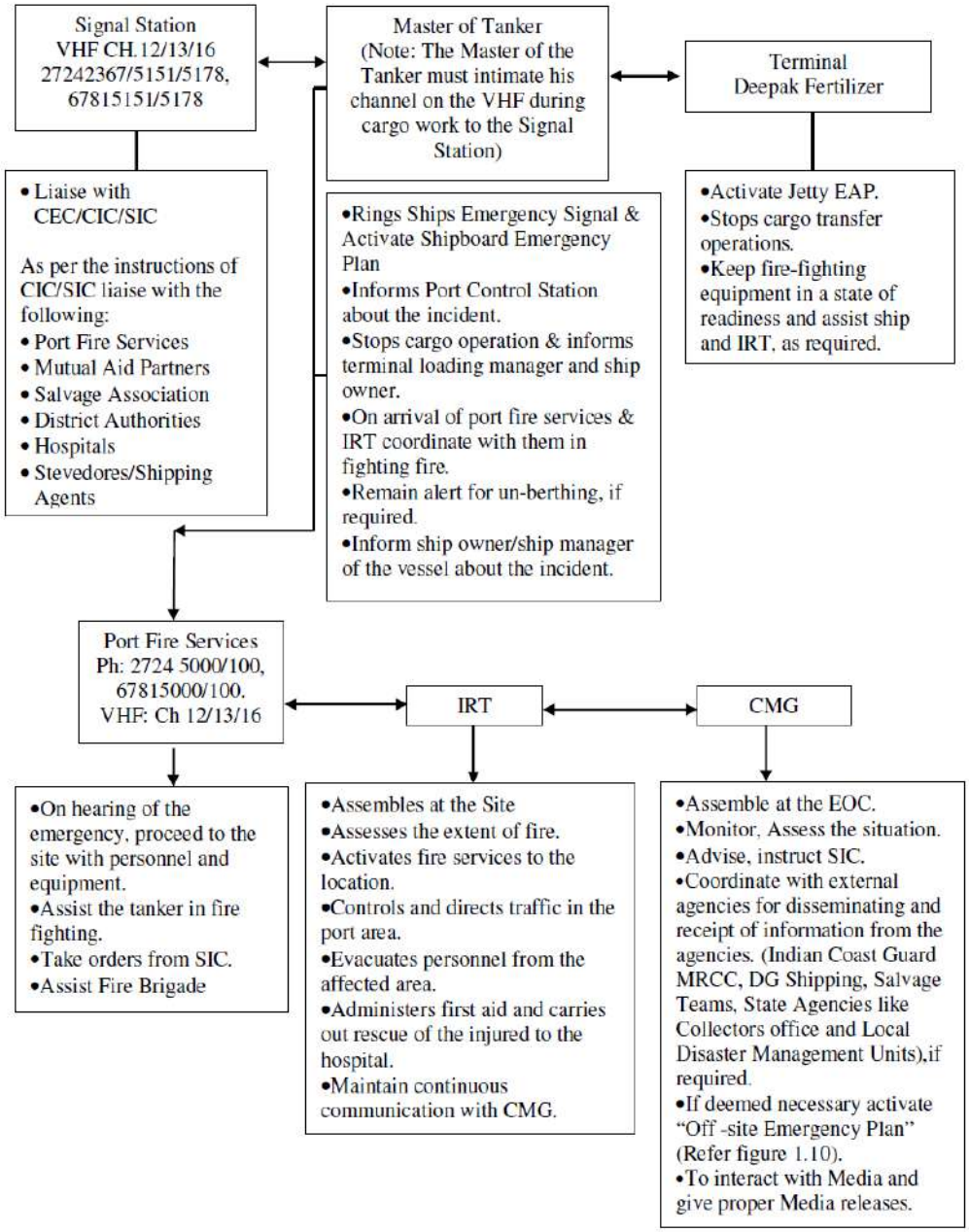
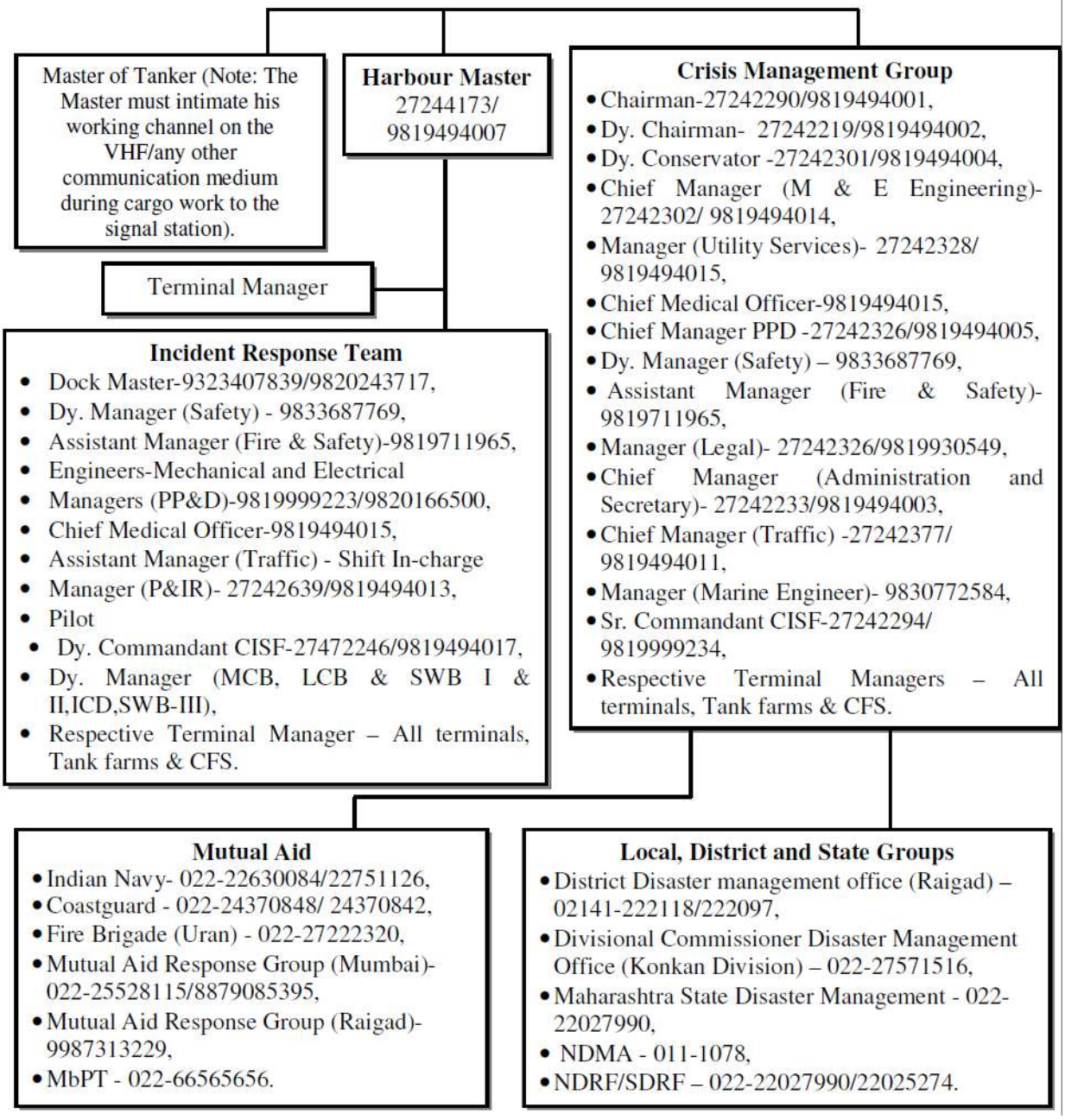


Figure S5.2: Action group



4. Action Plan

The vessel upon berthing terminal will follow standard procedures. However, in a lesslikely scenario a leak from the pipeline system may occur at the jetty leading to detection by vessel personnel or by the terminal alarm system. The following action will be required.

A. The Master of the Ship (Alternate: Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate ship board emergency action plan.	
b. Stop transfer operation (as per SOP of the ship).	
c. Terminal, Vessel in the vicinity and Port should be informed of any incident on the ship without delay.	• Terminal • Vessel in the vicinity • Port Control Station
d. Personnel to remain stand by to disconnect hoses;	
e. Shall be responsible to arrest the leak with ships own resources as well as with the available support from IRT.	
f. Also, to remain prepared to un-berth the ship to the safe area (high sea).	
g. The siren should be continued till the ship is taken to a safe location as per CIC instructions.	

B. The terminal persons tasked with cargo operations at the Jetty should

Response Action	Contact
a. Activate Jetty EAP (prepared by the terminal) and informJNPA.	• Port Control Station
b. Shut off isolation valve on pipeline at the berth (action as per SOP of the terminal).	
c. Area should be cordoned off.	
d. Assist IRT and provide all necessary equipment.	
e. Responsible for diluting and neutralizing the acids and disposal of the neutralized liquids down the drain.	
f. He will direct operation staff. Coordinate with the ship in-charge/C&F agents/stevedores.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station

Response Action	Contact
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Decide on clearing of ships in close proximity to the incident location or to sail the tanker to the higher seas and evacuating the people from the likely affected zone.	
f. Assess the condition of site and take decision on evacuation in consultation with SIC.	• SIC
g. Be in constant touch with District and Local Administration for rescue and relief operation.	
h. Terminate the response and debrief before allowing normal operation.	

D. The Port Control Station

Response Action	Contact
a. Gather information related to the vessel type, cargo quantity and position.	
b. Gather information related to the weather conditions. Monitor the wind directions and accordingly convey the message to Master of the vessel, SIC and F& SO.	• Master of the vessel • SIC • F& SO
c. Liaise with Master of the Vessel/Pilot.	• Master of the Vessel • Pilot
d. Communication to be maintained on VHF channel-13.	
e. Notify to CIC, SIC and the vessels moving into, through and inside the port. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC
f. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Navy • Coastguard • Stakeholders
g. Notify the information to the owner of the vessel as per the instruction of CIC/SIC/ Master of the Vessel.	

E. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the Master of the Tanker, Berth Manager and Terminal Manager.	Dock Master
		Conduct initial Briefing.	
		Report the situation to the CIC/CMG and assist CIC in assessing the incident.	
		Initiate DMP.	

Designated Officer	Role	Duties	Alternate Officer
		Assess the condition of site and take decision on evacuation in consultation with CIC.	
		Alert vessels within the vicinity.	
		Extend all necessary help to the Master of the ship.	
		Instruct the Asst. Manager (Fire and Safety) to keep the fixed firefighting installation in a state ofreadiness & activate if required.	
		Instruct Dock Master/ Marine Engineer(s) to keep tugs ready for firefighting.	
		Coordinate with all functional heads to take actions.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC /SIC.	Duty Supervisor
		Responsible for organizing tugsfor rescue.	
		Hire additional crafts as necessary.	
		Maintain Log of events.	
Master of the tanker	In Charge of firefighting operation on board vessel	Coordinate with action group leader and will be responsible for shutting down all cargo operation on board in coordination with terminal In Charge.	Chief Officerof Tanker
		Shall unberth the vessel as per theinstruction of SIC, if required.	
Terminal Managers- BPCL and Deepak Fertilizer	Cargo Work	Shall be responsible of shutting	Assistant Terminal Manager
		down of cargo operation & coordinating with JNPA and rendering necessary assistance to the SIC by providing additional emergency equipment as required.	
Asst. Manager (Fire and Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Lead the firefighting team and mobilize fire tenders, men & fire- fighting equipment to the scene & extend all necessary support to the Master of the vessel/Terminal Manager/Berth Manager.	
		Inform SIC for arrangement of any additional equipment as required.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders from the SIC. Assist in evacuation of the personnel to the assembly point or as directed by SIC.	Safety Inspector
		Conduct clean- up work during and after the emergency as quick as possible.	

Designated Officer	Role	Duties	Alternate Officer
Sr. Commandant - CISF	Security and Evacuation	Shall take orders from the SIC.	Dy. Commandant-CISF
		Cordon off the area.	
		Controls & Directs gate security and traffic in the area.	
		Shall facilitate evacuation, transport, first aid and rescue of personnel from the scene at the time of emergency.	
		Control the entry of unauthorized persons and vehicles.	
		Check for entry of emergency vehicles Liaise with the State Police.	
		Responsible the head count of the personnel.	
Chief Manager (Traffic)	Traffic Coordinator	Shall take orders from SIC and assist Manager NSDT.	Asst. Manager (Traffic)
		Regulate the traffic in the area.	
Chief Manager (Port, Planning and Development)	Civil Coordinator	Inform MPCB and other environmental agencies and take necessary guidance.	Manager (I, II)
		Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	
		Shall be responsible to carry out urgent civil works as required.	
Chief Manager (Mechanical &Electrical)	In charge of Electrical Installation	Shall be responsible for uninterrupted electrical supply to vital equipment and utility at the berth.	Asst. Engineer
		Shall remain alert on duty for any electrical isolation of equipment during emergency.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
		Shall coordinate with the local hospitals.	
Duty Pilot	In Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for rescue.	Sr. Dy. Manager (Marine Engg.)
		Hire additional crafts as necessary.	

Scenario 6 - Fire /Explosion at Nhava Sheva Distribution Terminal (NSDT) during handling of Chemicals – on Ship or Ashore

1. **Precautions:** MSDS, SOP of terminal and berthing and un-berthing procedure.

2. **Impact Zone:** Consequence analysis indicates that the MTBE leak from pipeline would coverapprox. 500 meters for Vapor cloud explosion (VCE) scenario.

3. **Resources required:** Organizational setup enumerated in Figure S6.2.

Figure S6.1: Action Flow Chart

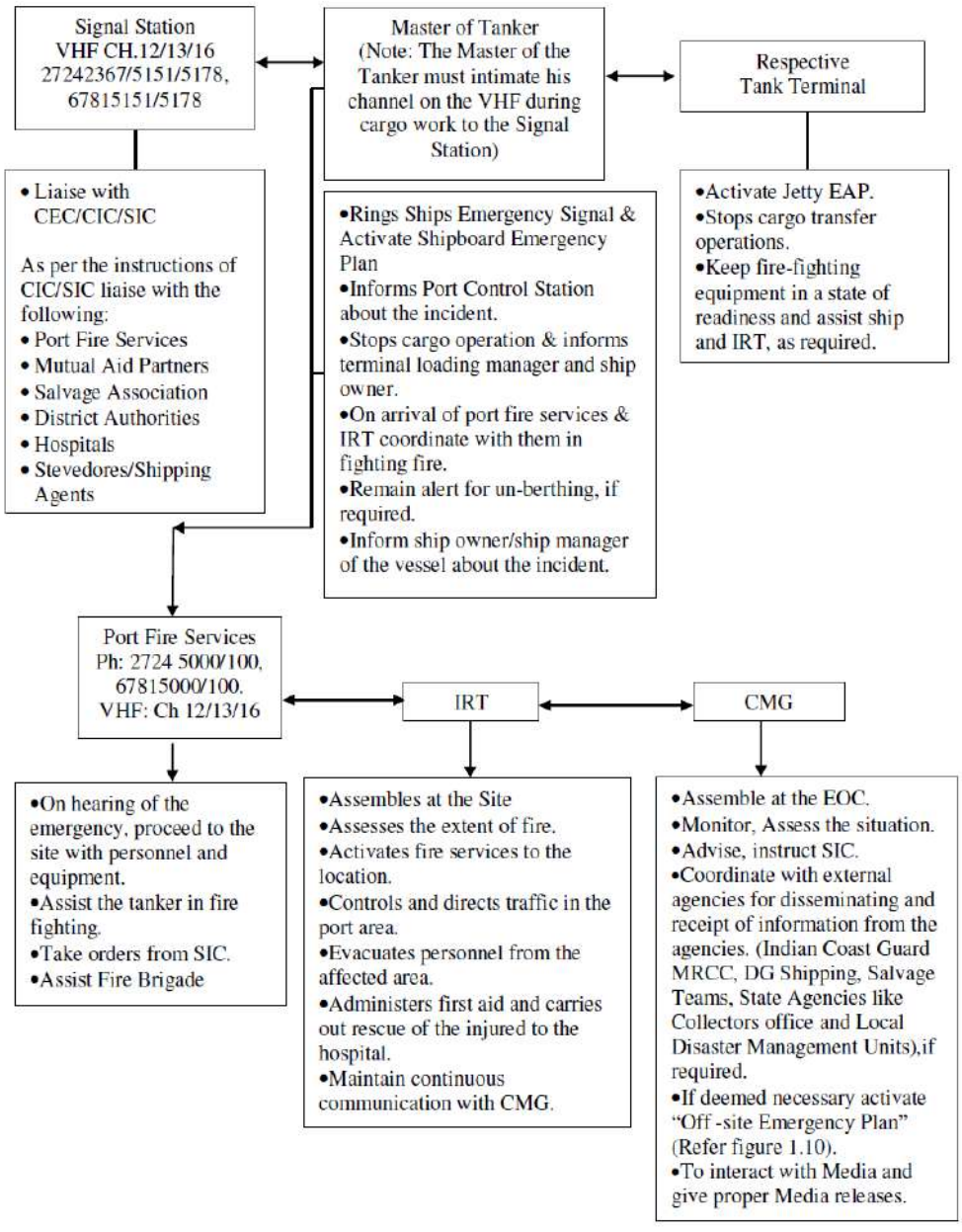
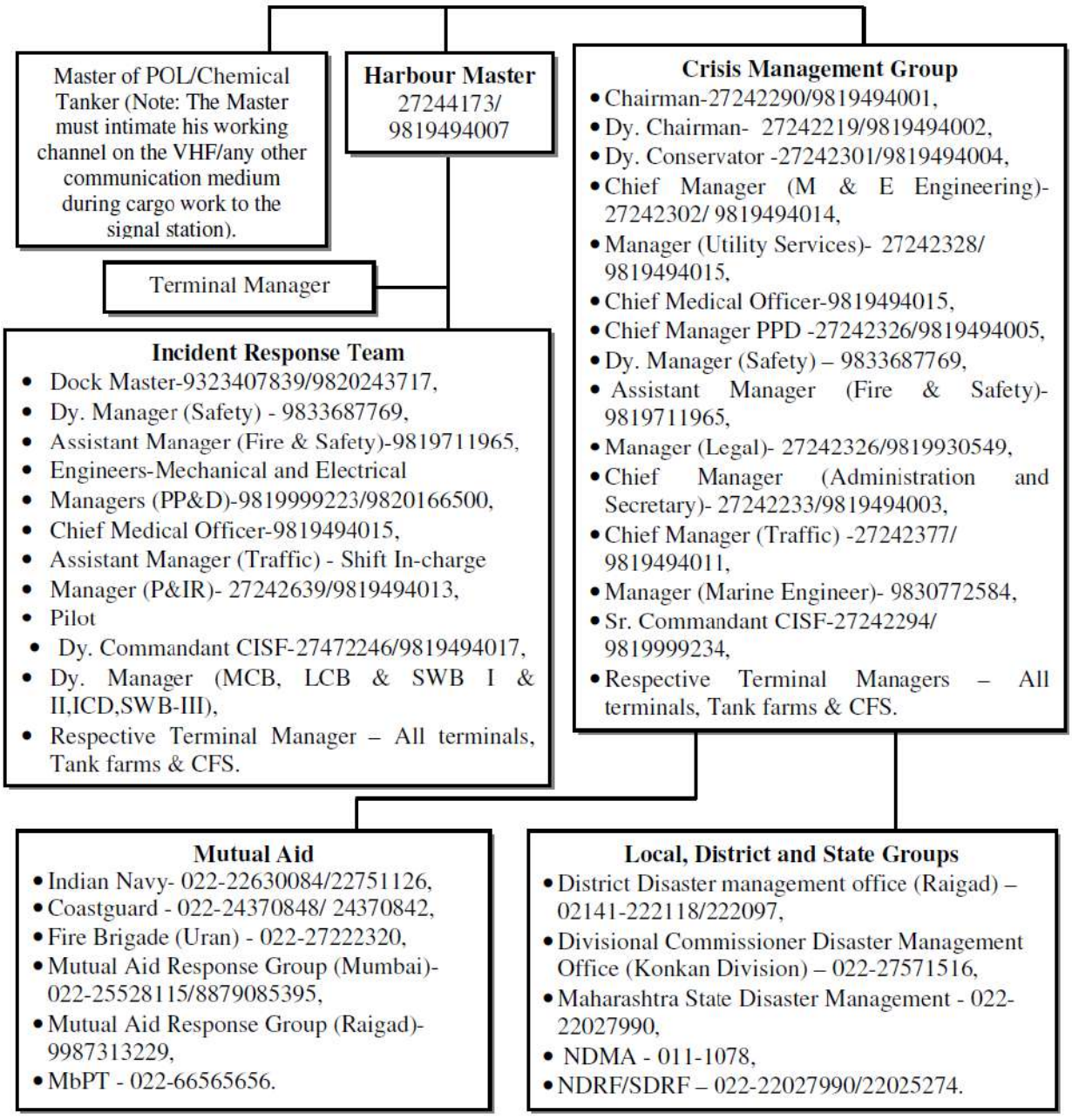


Figure S6.2: Action group



4. Action Plan

The vessel upon berthing terminal will follow standard procedures. However, in a lesslikely scenario a leak from the pipeline system may occur at the jetty leading to self- detection by vessel personnel or by the terminal automatic alarm system. Further in a more unlikely situation due to a possible ignition the leakage might catch fire and leading to explosion. The following action will be required

A. The Master of the Ship (Alternate: Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate ship board emergency action plan.	
b. Stop Chemical transfer operation (as per SOP of the ship).	
c. Terminal, Vessel in the vicinity and Port should be informed of any incident on the ship without delay.	• Terminal • Port Control Station
d. Personnel to remain stand by to disconnect hoses.	
e. Shall be responsible for fighting the fire with ships own resources as well as with the available support from IRT.	
f. Also, to remain prepared to un-berth the ship to the safe area (high sea).	
g. The siren should be continued till the ship is taken to a safe location as per CIC instructions.	

B. The terminal persons tasked with Chemical cargo operations at the Jetty should

Response Action	Contact
a. Activate Jetty EAP (prepared by the terminal) and informJNPA.	• Port Control Station
b. Shut off isolation valve on Chemical pipeline at the berth (action as per SOP of the terminal).	
c. Area should be cordoned off.	
d. Pour foam/dry chemical powder on Chemical spillage to reduce rate of vaporization.	
e. Assist IRT and provide all necessary equipment.	
f. He will direct operation staff. Coordinate with the ship in-charge/C&F agents/stevedores.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	

Response Action	Contact
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Assess the condition of site and of potential affected area and take decision on evacuation in consultation with SIC.	• SIC
f. Be in constant touch with District and Local Administration for rescue and relief operation.	
g. Terminate the response and debrief before allowing normal operation.	

D. The Port Control Station

Response Action	Contact
a. Gather information related to the weather conditions. Monitor the wind directions and accordingly convey the message to CIC/SIC and F& SO.	• CIC • SIC • F&SO
b. Liaise with Master of the Vessel/Pilot.	• Master of the Vessel • Pilot
c. Communication to be maintained on VHF channel-13.	•
d. Notify to CIC, SIC and the vessels moving into, through and inside the port. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC
e. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Navy • Coastguard • Stakeholders
f. Notify the information to the owner of the vessel as per the instruction of CIC/SIC/ Master of the Vessel.	

E. The Fire-fighting personnel should

Response Action	Contact
a. Raise Alarm (siren)	
b. Start the pumps as per the requirement	
c. Use water sprays and portable nozzles to maintain curtain.	
d. Open the valves of the monitors and direct the jet on the seat of fire.	
e. Inform fire officers to arrange for fire-fighting tug and Marine Engineer to arrange for tugs , as required.	• F&SO • Marine Engineer
f. In case of fire onboard assist Master in fighting fire as per Masters Instructions.	
g. Ensure all the ignition sources in the vicinity are extinguished if fire has not occurred.	

Response Action	Contact
h. If the fire is under control and extinguished, give all clear signal.	

F. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the Master of the Tanker, Berth Manager and Terminal Manager.	Dock Master
		Conduct initial Briefing.	
		He will report the situation to the CIC/CMG and assist CIC in assessing the incident.	
		Initiate DMP.	
		Alert vessels within the vicinity.	
		Assess the condition of site and take decision on evacuation in consultation with CIC.	
		Extend all necessary help to the Master of the ship to fight the fire.	
		Instruct the Asst. Manager (Fire and Safety) to keep the fixed firefighting installation in a state of readiness & activate if required.	
		Instruct Dock Master/ Marine Engineer(s) to keep tugs ready for firefighting.	
		Coordinate with all functional heads to take actions.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC /SIC.	Duty Supervisor
		Responsible for organizing tugs for rescue.	
		Hire additional crafts as necessary.	
		Maintain Log of events.	
Tank Terminal Manager	Cargo Work	Shall be responsible of shutting down of cargo operation & coordinating with JNPA and rendering necessary assistance to the SIC by providing additional firefighting & emergency equipment as required.	Assistant Terminal Manager

Designated Officer	Role	Duties	Alternate Officer
Asst. Manager (Fire and Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Lead the firefighting team and mobilize fire tenders, men & fire- fighting equipment to the scene & extend all necessary support to the Master of the vessel/Terminal Manager/Berth Manager for firefighting.	
		Inform SIC for arrangement of any additional equipment as required.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders from the SIC. Ensure responsible actions for containing the run off fire water and other water from the damaged units.	Safety Inspector
		Assist in evacuation of the personnel to the assembly point or as directed by SIC.	
		Conduct clean- up work during and after the emergency as quick as possible.	
Sr. Commandant - CISF	Security and Evacuation	Shall take orders from the SIC.	Dy. Commandant-CISF
		Cordon off the area.	
		Controls & Directs gate security and traffic in the area.	
		Shall facilitate evacuation, transport, first aid and rescue of personnel from the scene at the time of emergency.	
		Control the entry of unauthorized persons and vehicles.	
		Check for entry of emergency vehicles.	
		Liaise with the Police authorities.	
		Responsible the head count of the personnel.	
Chief Manager (Traffic)	Traffic Coordinator	Shall take orders from SIC and assist Manager LCB.	Asst. Manager (Traffic)
		Submits consolidated list of dangerous goods in port including tankers in port and tank farms in port area.	
		Regulate the traffic in the area.	
Chief Manager (Port, Planning and Development)	Civil Coordinator	Inform MPCB and other environmental agencies and take necessary guidance.	Manager (I, II)
		Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	
		Shall be responsible to carry out urgent civil works as required.	

Designated Officer	Role	Duties	Alternate Officer
Chief Manager (Mechanical & Electrical)	In charge of Electrical Installation	Shall be responsible for uninterrupted electrical supply to vital equipment and utility at the berth.	Asst. Engineer
		Shall remain alert on duty for any electrical isolation of equipment during emergency.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
		Shall coordinate with the local hospitals.	
Duty Pilot	In Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue.	Sr. Dy. Manager (Marine Engg.)
		Hire additional crafts as necessary.	

Scenario 7 - Damage due to Crane Accidents (Container drop/crane fall) at Container Terminal- NSICT, NSIGT, NSFT, GTI-APM, BMCT

1. **Precautions:** Trained personnel for operation of crane, SOP of the terminal.
2. **Impact Zone:** Surrounding area.
3. **Resources required:** Organizational setup enumerated in Figure S7.2.

Figure S7.1: Action Flow Chart

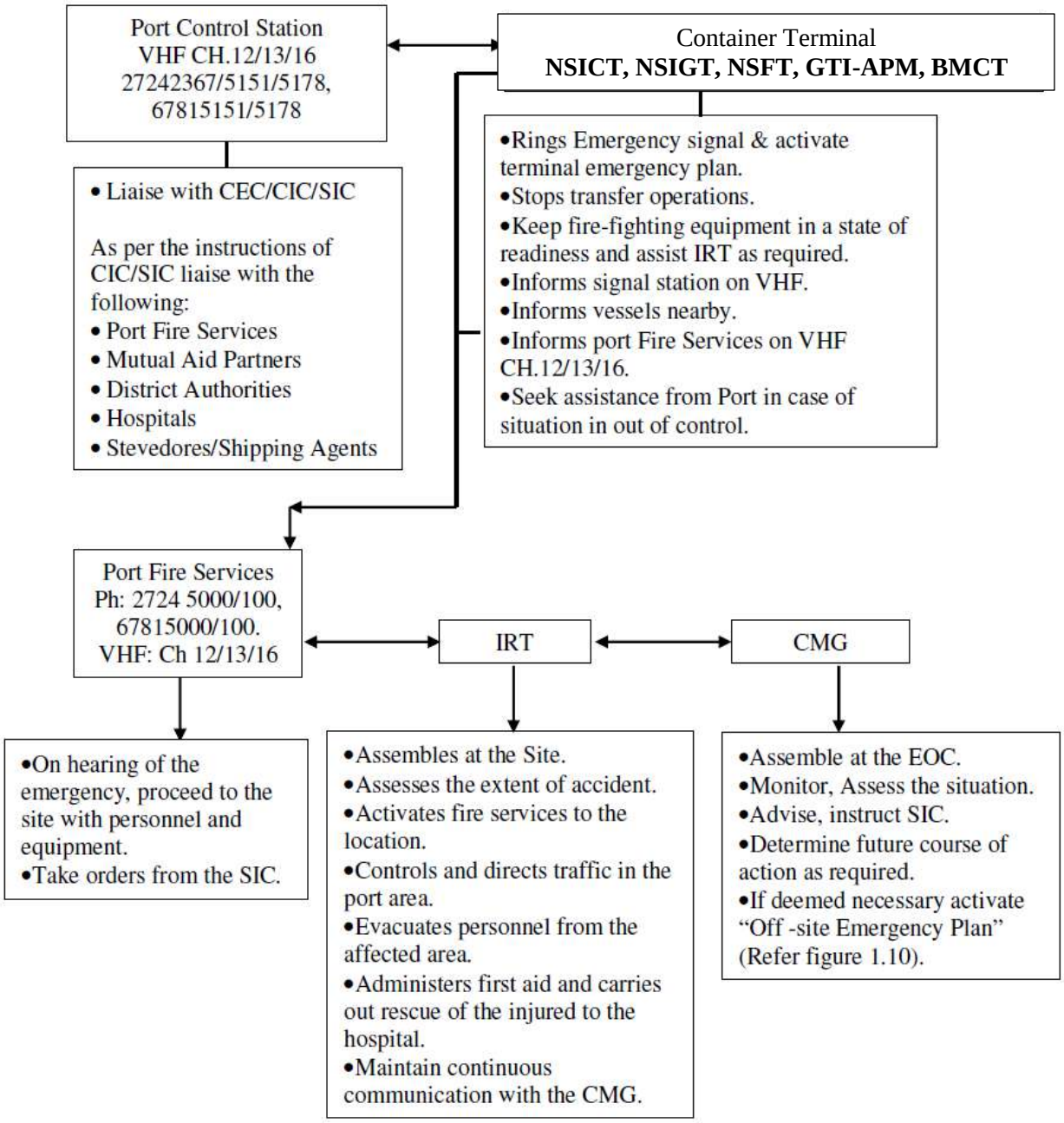
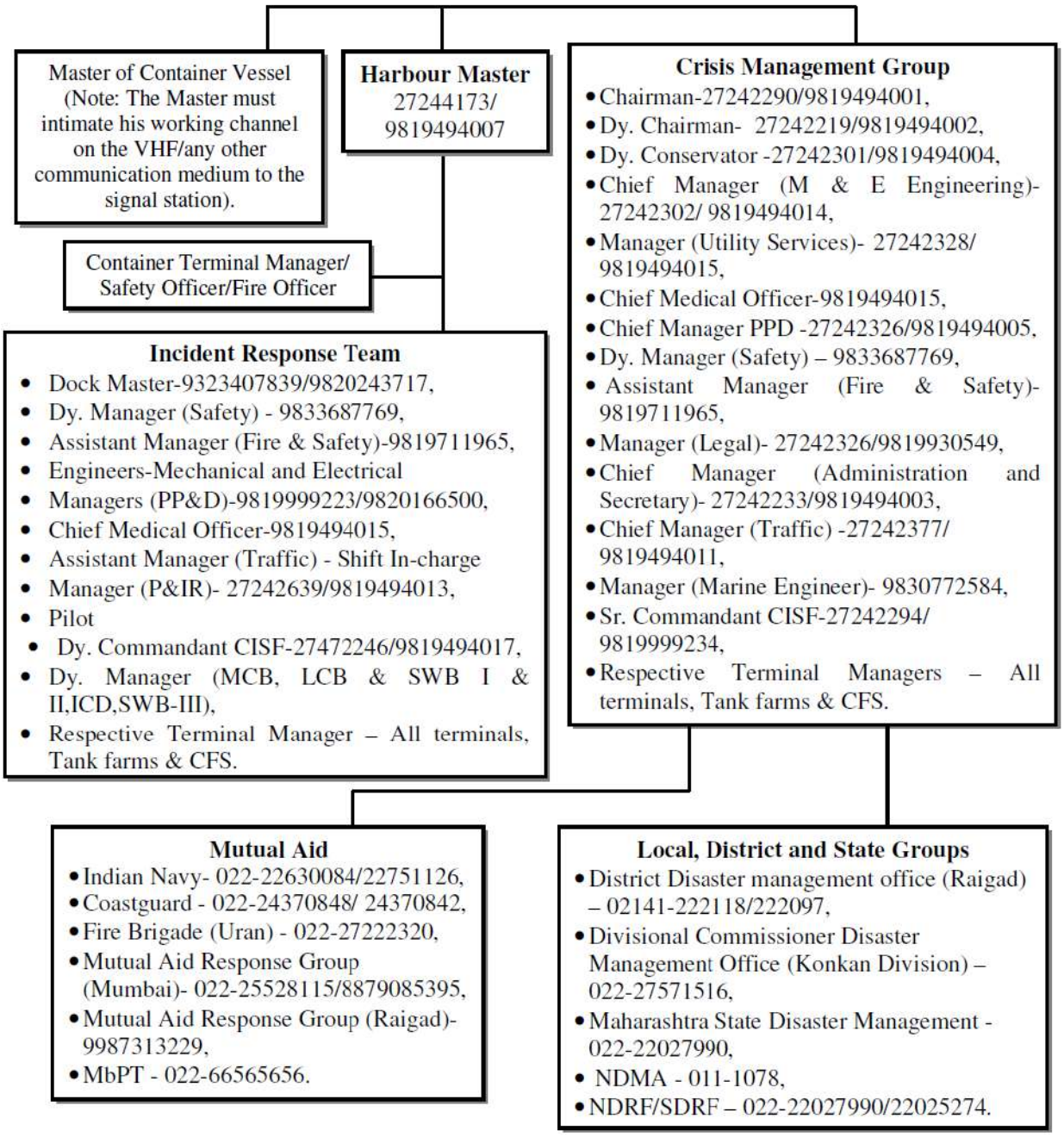


Figure S7.2: Action group



4. Action Plan

A. The crane operator

- Should raise emergency alarm and inform Terminal Manager and Port Control Station.

B. The terminal person at the Jetty should

Response Action	Contact
a. Activate EAP (prepared by the terminal) and inform JNPA and ask for assistance.	• Port Control Station
b. Area should be cordoned off.	
c. Stop transfer operations at the berth.	
d. Manage Truck movements.	
e. Assist IRT and Master of the Ship and provide all necessary equipment.	
f. He will direct operation staff.	
g. Interview operator and witnesses.	
h. Survey and cost damage to port installation. Complete maritime accident report. Give press reports.	
i. Distribute final report to concerned authorities.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Will be stationed at the EOC to review & assess possible developments to determine the most necessary course of action.	
b. He will give necessary instructions to SIC & arrange for external aid as necessary.	
c. Provide assistance to the Terminal.	

D. The Port Control Station

Response Action	Contact
a. Gather information regarding the incident and accordingly convey the message to CIC/SIC and F& SO.	• CIC • SIC • F& SO
b. Liaise with Master of the Vessels/Pilot.	• Master of the Vessels • Pilot
c. Communication to be maintained on VHF channel-13.	•
d. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC

Response Action	Contact
e. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Navy • Coastguard • Stakeholders

E. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the crane operator/terminal manager.	Dock Master
		Assess and report the situation to the CIC/CMG (if required).	
		Alert vessels/trucks within thevicinity.	
		Instruct the Asst. Manager (Fire & Safety) to keep the firefighting installation in a state of readiness& activate if required.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC/SIC.	Duty Supervisor
		Shall prepare vessels to vacatefrom berth (if required).	
		Responsible for organizing tugs for rescue. Instruct Pilot/Marine Engineers.	
		Hire additional crafts as necessary.	
		Maintain Log of events.	
Asst. Manager (Fire & Safety)	Fire Coordinator	Shall take orders from the SIC.	StationOfficer
		Mobilize fire tenders, men & firefighting equipment to the scene &extend all necessary support in case of fire.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Investigate the incident and provide necessary guidance.	Safety Inspector
		Assist in Rescue.	
Sr. Commandant -CISF	Security Officer	Controls & Directs traffic in thearea.	Dy. Commandant-CISF
		Shall supervise evacuation of personnel from the scene at the time of emergency.	
Chief Manager (PPD)	Civil Coordinator	Immobilizes faulty crane, informs manufacturer representative, port workshop superintendent / surveyor to inspect and investigate.	Manager(I, II)

Designated Officer	Role	Duties	Alternate Officer
Chief Manager (Mechanical &Electrical)	In-charge of Electrical Installation	Shall be responsible for Electrical supply to vital equipment and systems.	Asst. Engineer
		Arrange additional alternative shore cranes-power supply, wire slings blocks, shackles etc.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
Chief Manager (Traffic)	Traffic Coordinator	Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	Asst. Manager (Traffic)
		Coordinates with SIC and Terminal manager.	
Duty Pilot	In-Charge of Pilotage	Shall be ready on site for providing any assistance.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue.	Sr. Dy. Manager (Marine Engg.)
		Assist Dock Master.	

Scenario 8 - Containers falling into water in case of extreme weather, vessel collision or grounding

1. **Precautions:** Navigational Aid, Designated Pilots, Continuous monitoring and communication with the Port Control Centre and Pilot. Depending on the level of incidents involving containers falling and their recovery will require a team of tugs and floating cranes apart from measures such as medical assistance to the stricken vessel. Offsite plan in terms of alerting the fishing vessels and normal shipping traffic, coast guard and Indian navy will have to be activated. Port will remain in touch with vessel and provide assistance within its jurisdiction. Near coastal villages and township authorities need to be alerted. The type of cargo hazardous/ non-hazardous is to be ascertained and communicated by the concerned vessel to the port. Temporary closure of navigation in vicinity of the incident may be required. Radars deployed for monitoring and reporting the floating containers by nearby vessels in port zone. Wreck marking in case of sink age of container will be required.

2. **Impact Zone:** Incident Location and vicinity of the coastline involved.

3. **Resources required:** Organizational setup enumerated in Figure S8.2.

Figure S8.1: Action Flow Chart

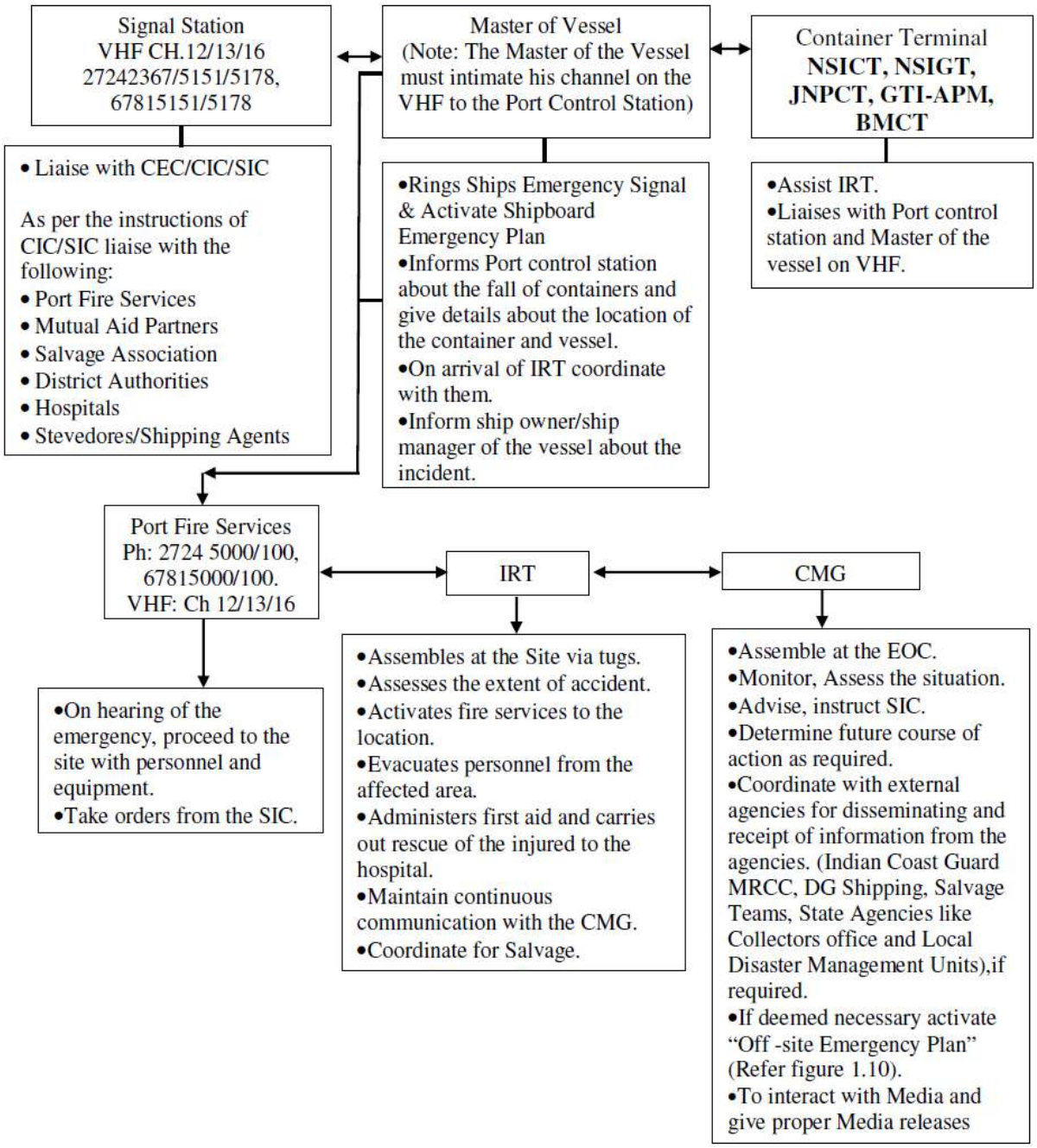
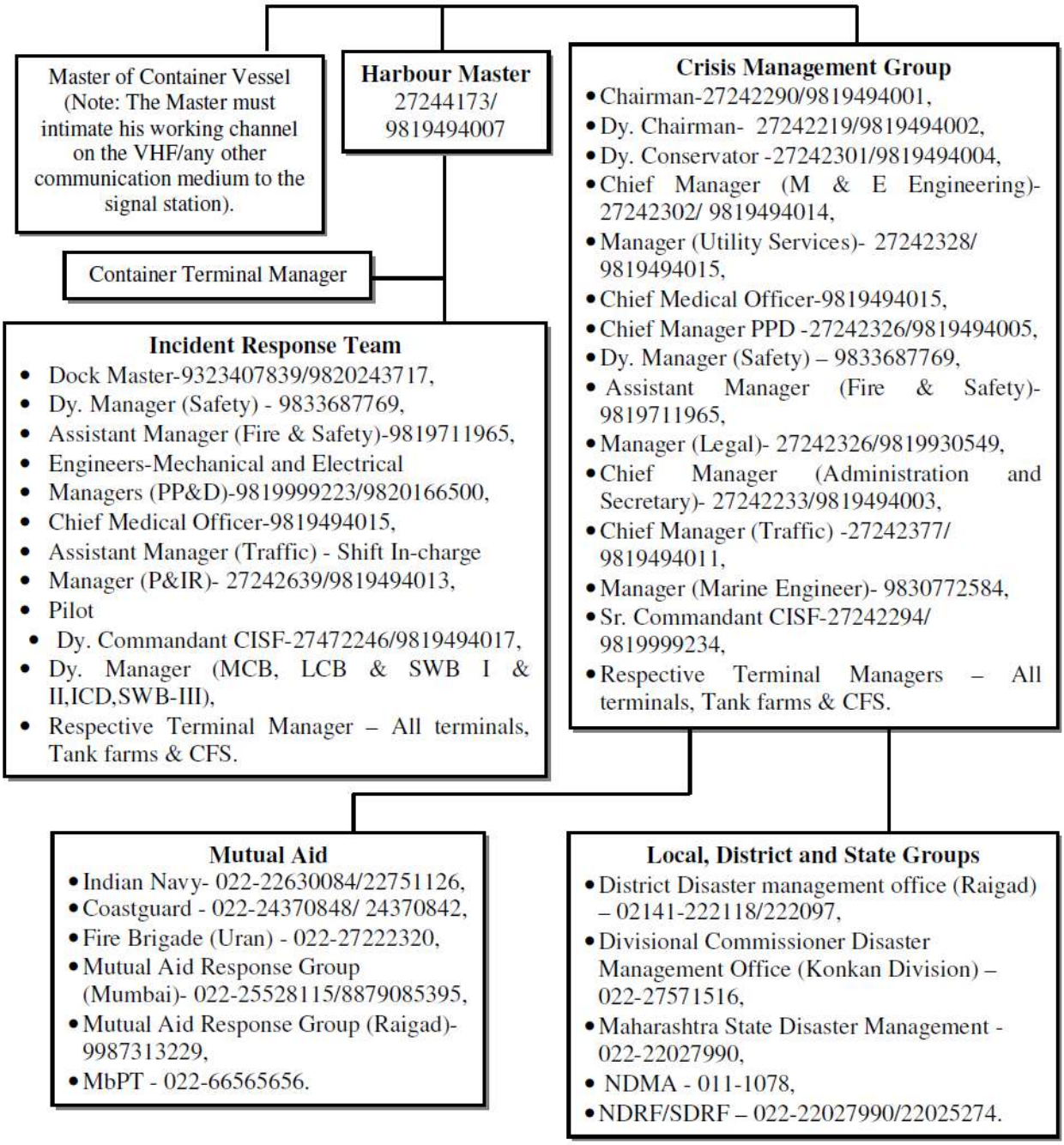


Figure S8.2: Action group



4. Action Plan

A. The Master of the Vessel (Alternate: Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate ship board emergency action plan.	
b. Terminal, Vessel in the vicinity and Port should be informed of any incident on the ship without delay.	• Terminal • Vessel in the vicinity • Port Control Station
c. Details of the location and type of the container and vessel, type of cargo and quantity and time of incident should be given to the Port control station and the terminal.	
d. Inform ship owner/ship manager of the vessel about the incident.	

B. Port Control Station should

Response Action	Contact
a. Gather information related to the vessel position, container position and time of incident.	
b. Notify to CIC, SIC and the vessels moving into, through and near the casualty and inside the port.	• CIC • SIC • Navy • Coastguard • DG Shipping
c. Gather information about the weather and tide and notify CIC/SIC.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Decide on clearing of ships in close proximity to the incident location.	
f. Be in constant touch with District and Local Administration for rescue and relief operation.	

Response Action	Contact
g. Terminate the response and debrief before allowing normal operation.	

D. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information from the crane operator/terminal manager.	Dock Master
		Assess and report the situation to the CIC/CMG (if required).	
		Initiate DMP.	
		Alert vessels within the vicinity.	
		Extend all necessary help to the Master of the vessel.	
		Instruct Dock Master/ Marine Engineers to keep tugs ready.	
		He will coordinate with all functional heads to take actions.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC/SIC.	Duty Supervisor
		Shall prepare vessels to vacate from berth (if required).	
		Responsible for organizing tugs, mooring boats and Pilots. Instruct Marine Engineers.	
		Hire additional crafts as necessary.	
		Assist SIC and maintain Log of events.	
Container Terminal Manager	Terminal Fire Coordinator	Provide assistance to port and vessel.	Assistant Officer
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Investigate the incident and provide necessary guidance.	Safety Inspector
		Assist in Rescue.	
Sr. Commandant -CISF	Security Officer	Controls & Directs traffic in the area.	Dy. Commandant-CISF
		Shall supervise evacuation of personnel from the scene at the time of emergency.	
Chief Manager (PPD)	Civil Coordinator	Liaise with SIC.	Manager (I, II)

Designated Officer	Role	Duties	Alternate Officer
Chief Manager (Mechanical & Electrical)	In-charge of Electrical Installation	Arrange for specialized equipment if required as per the instruction of the SIC.	Asst. Engineer
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
Chief Manager (Traffic)	Traffic Coordinator	Coordinates with Terminal manager. Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	Asst. Manager (Traffic)
Duty Pilot	In-Charge of Pilotage	Shall be ready on site for providing any assistance and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue. Assist Dock Master.	Sr. Dy. Manager (Marine Engg.)

Scenario 9 - Fire in Engine room of Floating Craft

1. **Precautions:** Crew trained for Fire Fighting, Periodic Maintenance and Inspection, House Keeping.

2. **Impact Zone:** Craft and immediate surroundings.

3. **Resources required:** Organizational setup enumerated in Figure S9.2.

Figure S9.1: Action Flow Chart

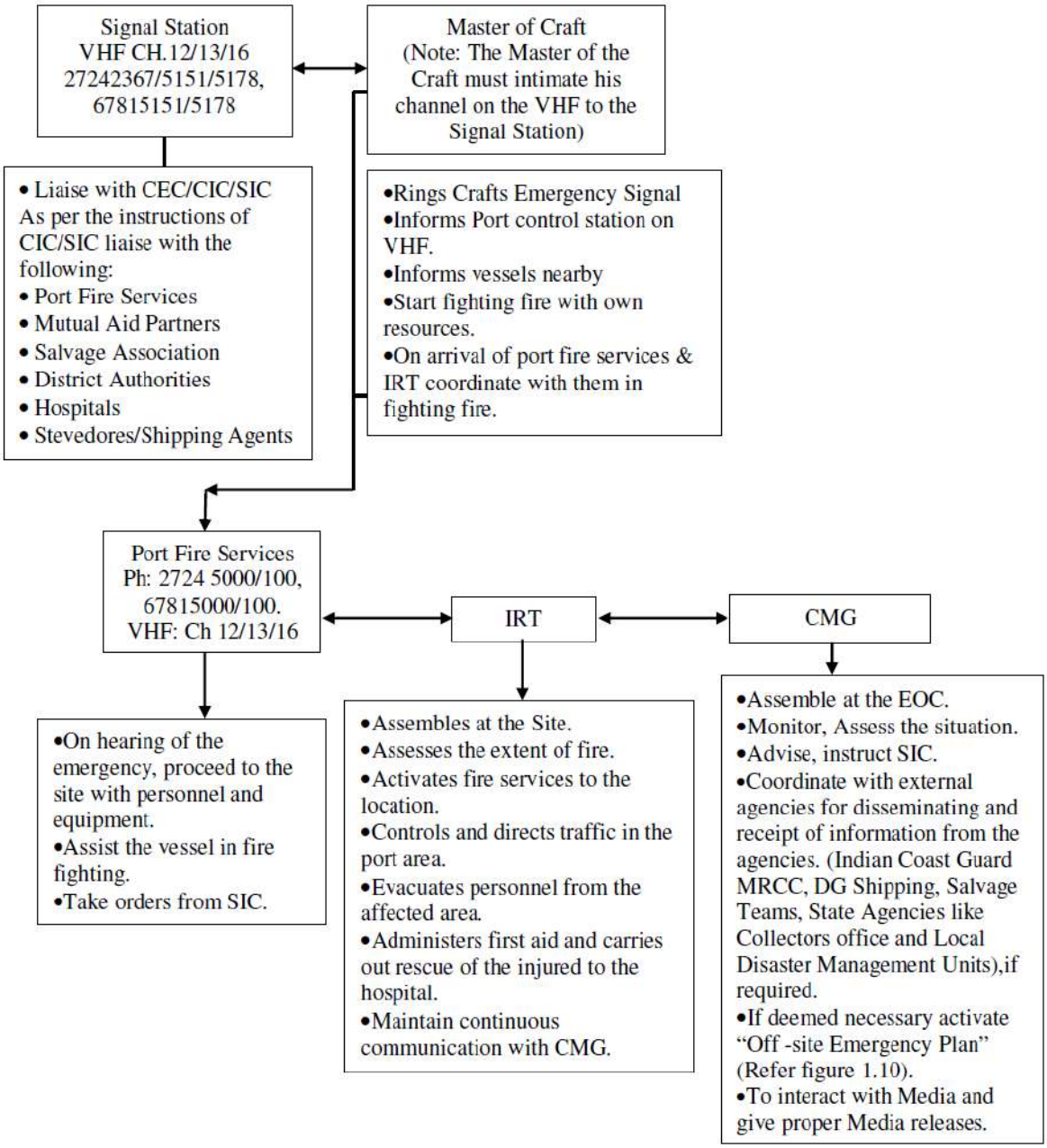
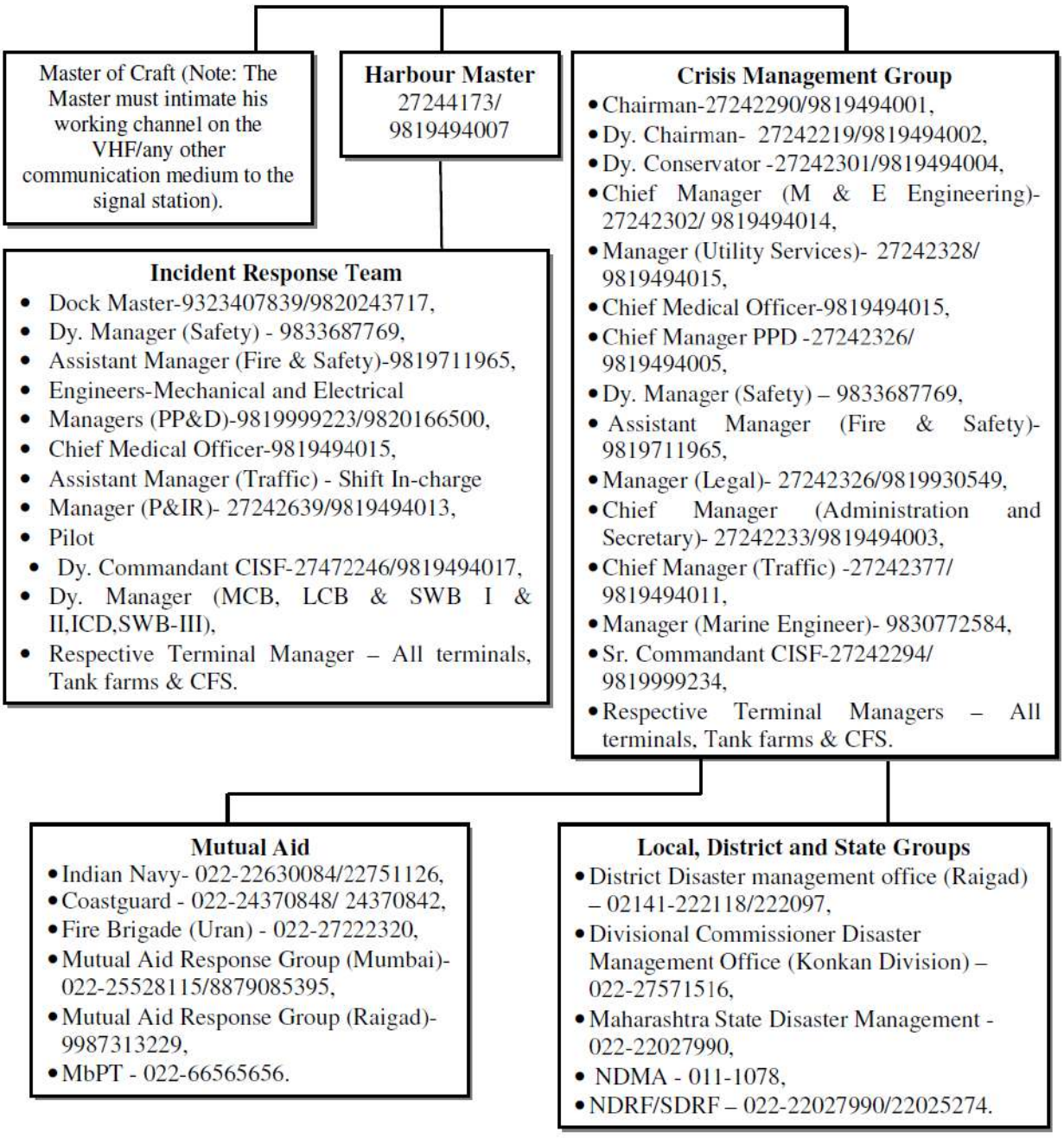


Figure S9.2: Action group



4. Action Plan

A. The Master of the Craft

Response Action	Contact
a. Should raise crafts emergency alarm and activate craft board emergency action plan.	
b. Vessel in the vicinity and Port should be informed of any incident on the craft without delay. Try to keep craft away from any vessel/craft in the vicinity.	• Vessel in the vicinity • Port Control Station
c. Shall be responsible for fighting the fire with craft own resources as well as with the available support from IRT.	

B. Port Control Station should

Response Action	Contact
a. Gather information related to the vessel position, andtime of incident.	
b. Notify to CIC, SIC and the vessels moving into, through and near the casualty and inside the port.	• CIC • SIC • Navy • Coastguard • DG Shipping
c. Gather information about the weather and tide and notify CIC/SIC.	• CIC • SIC

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Decide on clearing of ships in close proximity to the incident location.	
f. Be in constant touch with District and Local Administration for rescue and relief operation.	
g. Terminate the response and debrief before allowing normal operation.	

D. The Fire-fighting Personnel (F &ASO-I) should (Alternate: F &ASO-II)

Response Action	Contact
a. Collect the information from Port Control Station andSIC.	• SIC • Port Control Station
b. Assist Master in fighting fire as per Masters Instructions.	
c. He will mobilize firefighting tugs, personnel & firefighting equipment to the scene & extend all necessary support in case of fire, if required.	
d. Assist in evacuation of the personnel as directed by SIC.	
e. Inform SIC for arrangement of any additional equipment as required.	

E. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceedto the scene & communicate & collect all information from the master of the craft.	Dock Master
		He will report the situation to the CIC/CMG.	
		Alert vessels/craft within thevicinity.	
		Extend all necessary support to theMaster of the craft to fight the fire.	
		Instruct the Asst. manager (Fire and Safety) to keep the firefighting installation and firefighting tugs in a state of readiness & activate if required.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC/SIC.	Duty Supervisor
		Responsible for organizing tugsfor rescue.	
		Hire additional crafts as necessary.	
		Assist SIC and maintain Log ofevents.	
Asst. Manager (Fire & Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Lead the firefighting team and mobilize fire tenders, men & fire- fighting equipment to the scene & extend all necessary support to the master of the craft for firefighting.	
		Inform SIC for the arrangement of any additional equipment as required.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders for SIC.	Safety Inspector
		Ensure safely rescue of the Master of the craft.	
		Conduct cleanup work during and after the emergency as quick as possible.	

Designated Officer	Role	Duties	Alternate Officer
Sr. Commandant -CISF	Security and Evacuation	Controls & directs traffic in the area.	Dy. Commandant-CISF
		Cordon off the area.	
		Shall supervise evacuation of personnel from the scene at the time of emergency.	
Chief Manager (PPD)	Civil Coordinator	Liaise with SIC.	Manager(I, II)
Chief Manager (Mechanical &Electrical)	In-charge of Electrical Installation	Shall be responsible for Electrical supply to vital equipment and systems at the berth.	Asst. Engineer
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
Chief Manager (Traffic)	Traffic Coordinator	Shall prepare vessels (in the vicinity) to vacate from berth.	Asst. Manager (Traffic)
		Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	
		Coordinates with ship owners/agents/stevedores.	
Duty Pilot	In-Charge of Pilotage	Shall be ready on site for taking the ship out of berth, if required.	Standby Pilot
		Shall be ready for providing any assistance on site.	
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue.	Sr. Manager (Marine Engg.)
		Hire additional crafts as necessary.	

Scenario 10 - Ship Grounding/Collision within JNPA port limit.

1. **Precautions:** Navigational Aid, Designated Pilots, Continuous monitoring and communication with the Port Control Centre and Pilot.

2. **Impact Zone:** Navigational Channel and Anchorage area.

3. **Resources required:** Organizational setup enumerated in Figure S10.2.

Figure S10.1: Action Flow Chart

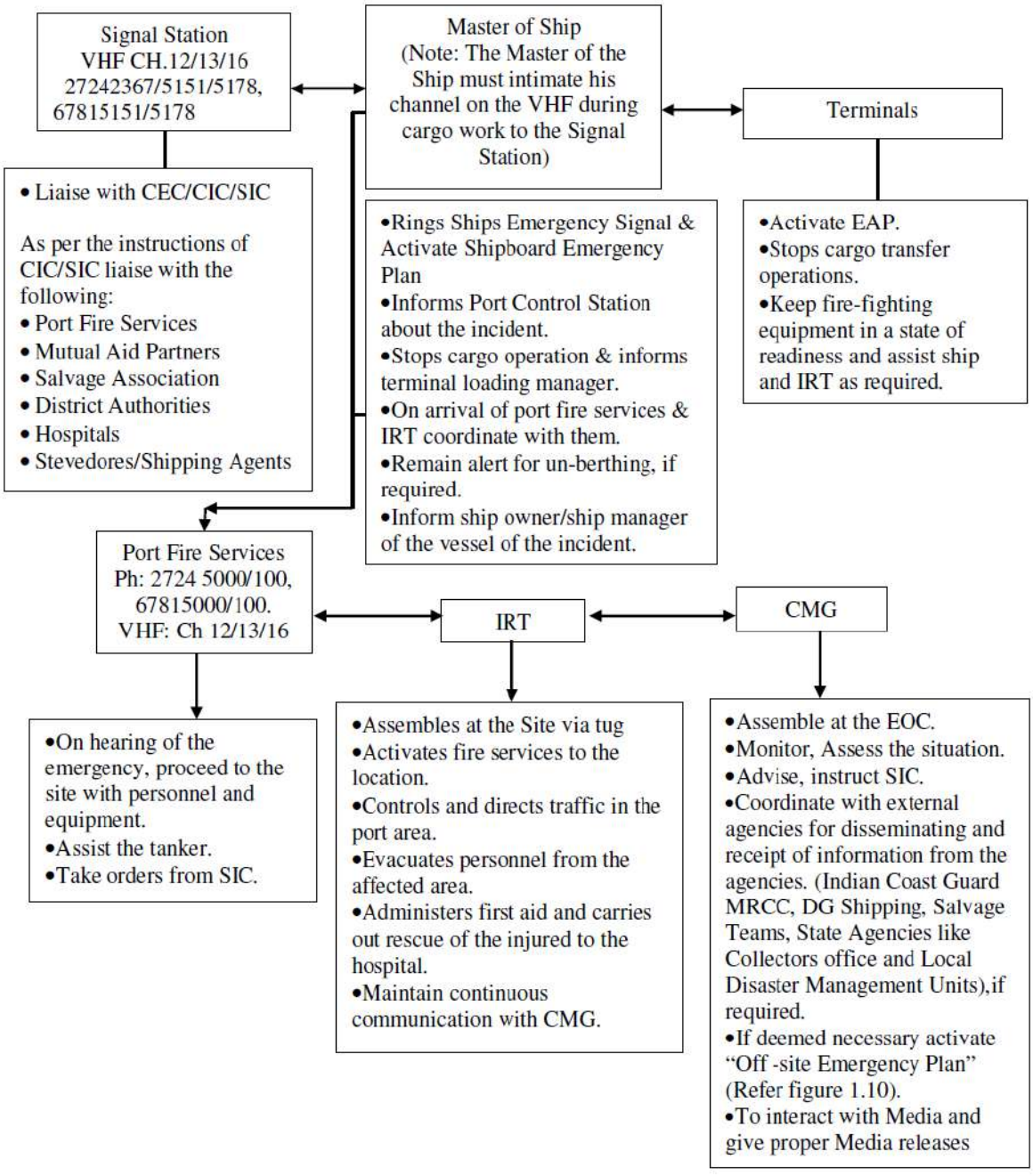
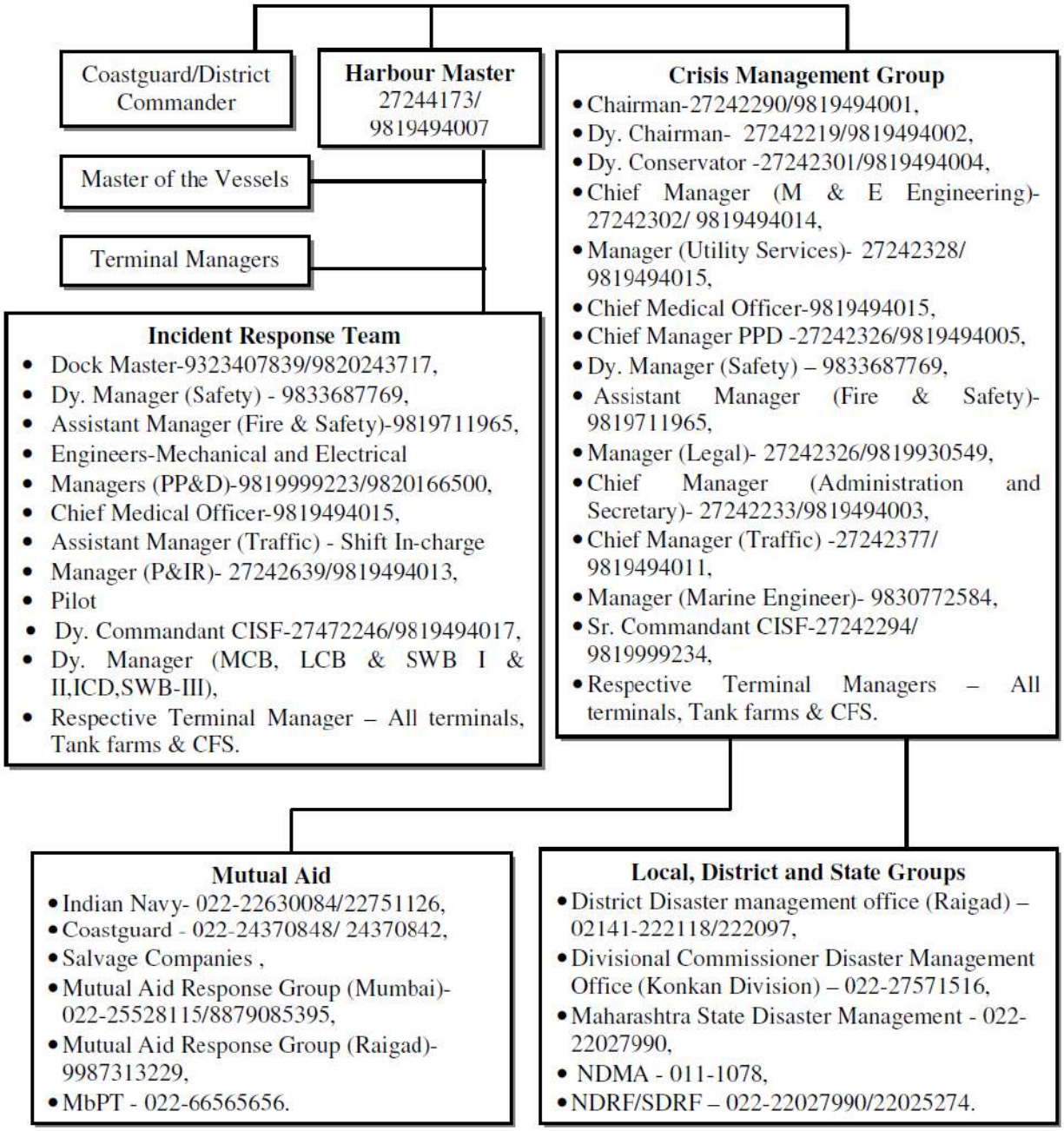


Figure S10.2: Action group



4. Action Plan

A. The Masters of the Vessels (Alternate: Chief Officers)

Response Action	Contact
a. Should raise ships emergency alarm and activate ship board emergency action plan including evacuation of the personnel.	
b. Vessel in the vicinity, Terminal and Port should be informed of any incident on the craft without delay.	• Terminal • Vessel in the vicinity • Port Control Station
c. Shut down transfer operation (if at berth).	
d. Take appropriate damage control measures in case of flooding including leak stoppage and pumping out, vessel list correction etc.	
e. Estimate the extent of under water damage, sounding of tanks and actions for the refloating of the vessel.	
f. Shall be responsible for fighting the fire (in case of fire) with vessels own resources as well as with the available support from IRT.	

B. The Port Control Station

Response Action	Contact
a. Liaise with Master of the Vessel/Pilot and gather the information about the type of vessels involved in the incident, cargo and location of the incident and convey the message to CIC/SIC.	• Master of the vessel • Pilot • CIC • SIC
b. Gather information related to the weather conditions. Monitor the wind directions and accordingly convey the message to CIC/SIC and F& SO.	• CIC • SIC • F&SO
c. Communication to be maintained on VHF channel-13.	•
d. Notify to CIC, SIC and the vessels moving into, through and inside the port. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC
e. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Indian Navy • Coastguard • Stakeholders
f. Notify the information to the owner of the vessel as per the instruction of CIC/SIC/ Master of the Vessel.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP andOSCP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Decide on clearing of ships in close proximity to the incident location.	
f. Be in constant touch with District and Local Administration for rescue and relief operation.	
g. Terminate the response and debrief before allowing normal operation.	

D. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency, he shall proceed to the affected location & communicate & collect all necessary information's from theMaster of the ship.	Dock Master
		Report the situation to theCIC/CMG.	
		Activate Port DMP and OSCP.	
		In case of fire on board the vessel after collision or contact he will extend all necessary help to the Master of the ship.	
		Instruct Dock Master/ Marine Engineer(s) to keep tugs ready for fire-fighting.	
		Alert other vessels within thevicinity.	
		Ascertain oil pollution- leak source, if any.	
		Obtain information regarding stability and hull stress of the vessel.	
		If vessels have blocked or a possibility of blocking the channel, in co-ordination with the Master, the vessel shall be taken to berth / anchorage.	
		In case of grounding, make arrangements through Dock Master/ Marine Engineers/ Pilots to proceed to the spot and to take	

Designated Officer	Role	Duties	Alternate Officer
		soundings, plot them in a chart and to ascertain the location of grounding damage on the hull.	
		Depending on the way the vessel is grounded and the available high tide on the day, all advance preparations should be made to commence the towing operation at least two hours before the high water or as advised by CIC/SIC.	
		Inform MOEF and MPCB approved parties for safe disposal and providing reception facilities for Oil/Sludge. Also, inform Salvage association.	
Dock Master	Port Control Room Coordinator	Shall be ready for taking the instructions from CIC/SIC and evacuate/move/shift the vessel from the area.	Duty Supervisor
		If possible, accompany SIC to inspect the vessel.	
		Plot exact location of the incident.	
		Responsible for organizing tugs for rescue. Instruct Marine Engineers.	
		Hire additional crafts as necessary.	
Dy. Manager – Safety	Marine Pollution Control Coordinator	Supervise and direct personnel to follow the instructions given by SIC.	Safety Inspector
		Report to SIC and seek advice if in doubt.	
		Lead the response team and support personnel in combating the disaster by deploying booms and other equipment.	
		Coordinate with the party involved in disposal of the Oil/sludge in a	
		safe manner.	
		Liaise with the OSRO team and coordinate with the team in combating the disaster by taking necessary actions as per the OSCP.	
		Maintain records of the claims.	
Asst. Manager (Fire & Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Mobilize fire tenders, men & firefighting equipment to the scene & extend all necessary support to the master of the vessel for firefighting.	
		Coordinate with the party involved in disposal of the Oil/sludge in a safe manner.	

Designated Officer	Role	Duties	Alternate Officer
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first-aid team with ambulance & necessary medicines to attend to any injured person.	Alternate Officer
Chief Manager (PP&D)	Civil Coordinator	Inform MPCB as per the instruction of CIC/SIC and other environmental agencies about the incident for getting necessary guidance.	Manager(I, II)
		Instruct the contractors to carry out urgent civil works as required.	
		Hire the barges for collecting the spilled oil and coordinate with the parties involved in the safe disposal of the oil/sludge.	
Chief Manager (Traffic)	Traffic Coordinator	Coordinates with ship owners/agents/stevedores.	Asst. Manager (Traffic)
		Regulate Traffic in the vicinity.	
Duty Pilot	In Charge of Pilotage	Shall monitor the communication on VHF & convey and relay messages on the advice from CIC/ SIC.	Standby Pilot
		He will maintain Log of events.	
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for shifting the vessel to the anchorage area if required.	Sr. Dy. Manager (Marine Engg.)

Scenario 11 - Blockage of Navigational Channel due to Grounding/sinking of vessel (Wreckage)

1. **Precautions:** Navigational Aid, Designated Pilots, Continuous monitoring and communication with the Port Control Centre and Pilot.

2. **Impact Zone:** Navigational Channel.

3. **Resources required:** Organizational setup enumerated in Figure S11.2.

Note: *Under the Indian Ports Act, 1908, if a ship is wrecked, stranded or sunk within the port limits, the Conservator of the Ports or in the absence of such an office, the Harbour master may give notice to the owner of the vessel "to raise, remove or destroy the vessel within such period as may be specified in the notice and to furnish such adequate security to the satisfaction of the conservator to ensure that the vessel shall be raised, removed or destroyed within the saidperiod". If the owner does not comply and act upon the notice, the conservator may raise, remove or destroy the property and claim the compensation from the owner. Mostly, the salvage activity will be done by private salvors in agreement with the Port Trust. Within the port limits, the capacity of the party to carry out salvage, the methods used to raise or remove or destroy the vessel is subjected to the expert opinion of the deputy conservator of the port. Normally, the court will not interfere with these technical decisions.*

Figure S17.1: Action Flow Chart

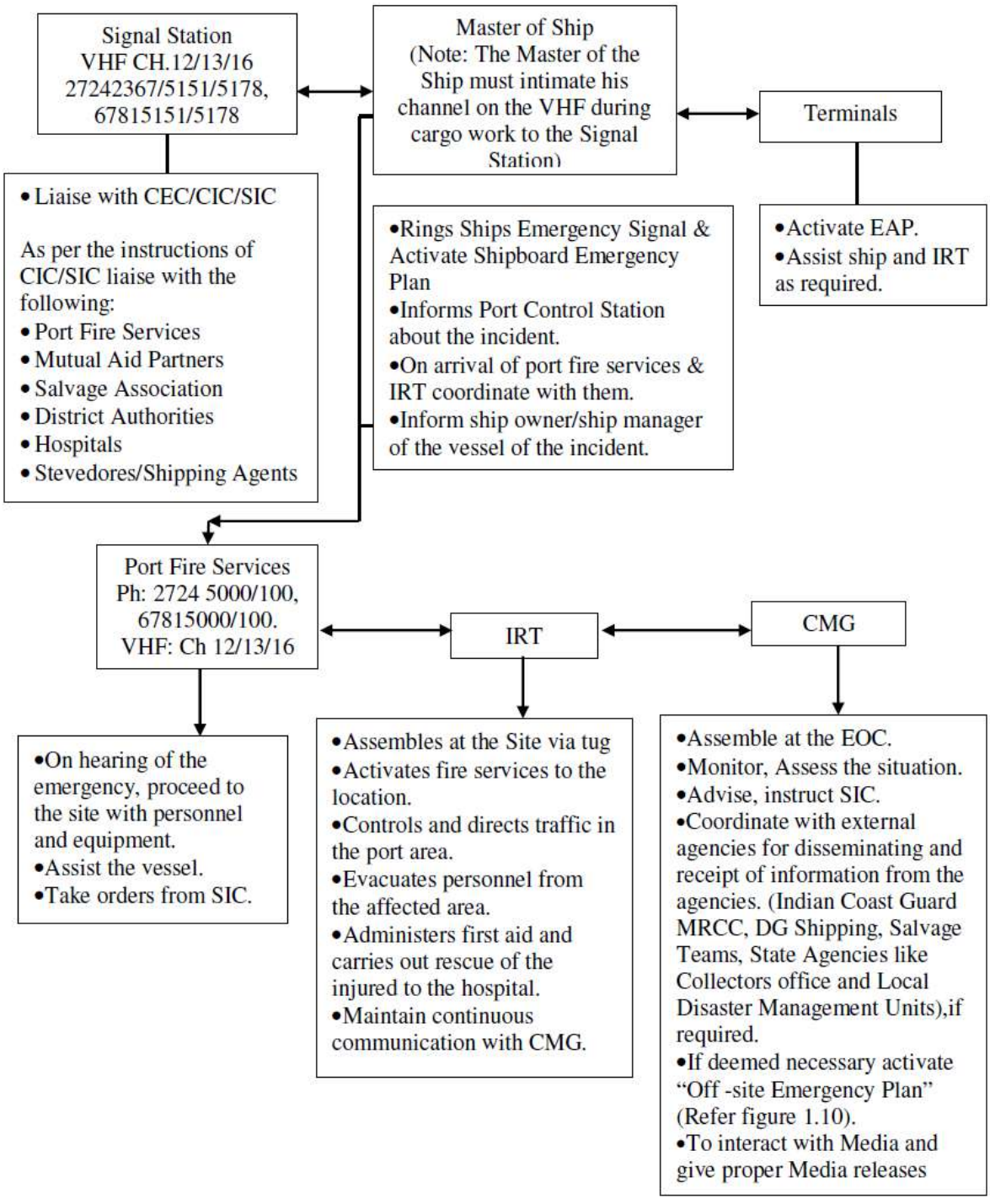
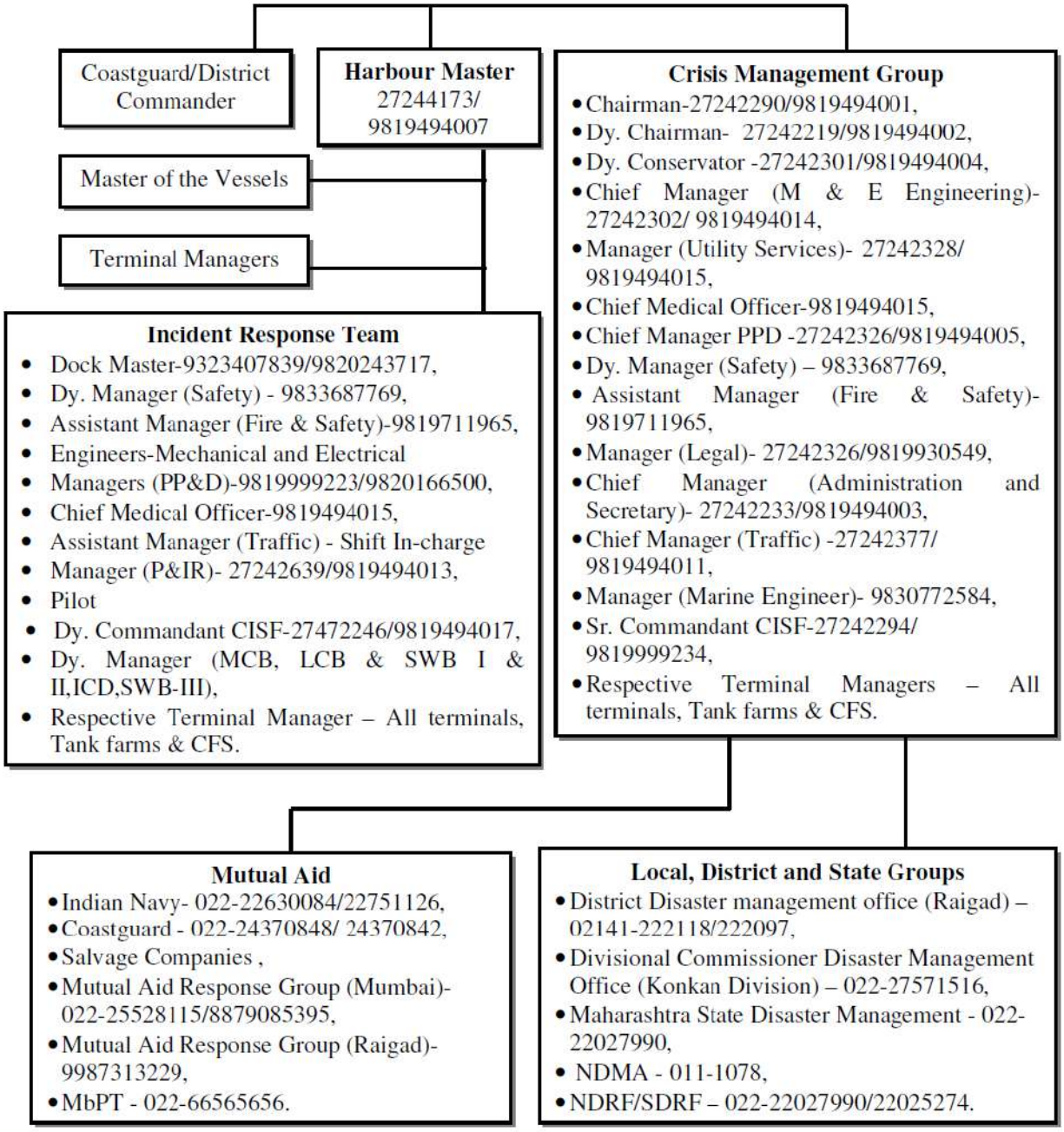


Figure S17.2: Action Group



4. Action Plan

A. The Master of the Vessel (Alternate: Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate ship board emergency action plan.	
b. Terminal, Vessel in the vicinity and Port should be informed of any incident on the ship without delay.	• Terminal • Vessel in the vicinity • Port Control Station
c. Having raised the alarm, the Master will be responsible for taking all immediate steps to safeguard his ship. As soon as possible he is to establish the extent of grounding and damage to the vessel. He is to ascertain whether the hull has been breached and likely risk of pollution and flooding.	
d. The Master will provide the Port Authority with details of the incident as quickly as possible and will make regular and frequent reports on the progress of the incident. This is to include position of grounding, damage sustained, pollution or risk of pollution, draft of the vessel prior to grounding and soundings at grounding area, cargo on board and location, and any further information that may be at hand.	• Port Control Station

B. Port Control Station should

Response Action	Contact
a. Gather information related to the vessel type, position andtime of incident.	
b. Liaise with Master of the Vessel/Pilot.	• Master of the vessel • Pilot
c. Notify to CIC, SIC and the vessels moving into, through and near the casualty and inside the port.	• CIC • SIC • Navy • Coastguard
d. Notify the information to the owner of the vessel.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
b. Assess the level of disaster and activate the DMP.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station

Response Action	Contact
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Launches and rescue craft will be sent to scene of Emergency. If required they will bring necessary personnel and equipment to site.	• Dock Master • Marine Engineers
f. **Oil Pollution:** He will be responsible to activate the Port OSCP on receipt and assessment of the information gathered. He will instruct the IRT and Master of Vessel about the precautionary measures and necessary actions to limit the extent of pollution.	• Coastguard
g. **Evacuation:** Assessment of condition of site of potential affected area and decision taken for evacuation should be taken in consultation with SIC and Master of Vessel.	•
h. **Salvage and or floating of the vessel** will be controlled by either the CIC or person assigned by him. All operations will have to be sanctioned by the CIC before implementation.	• Salvage Company
i. Coordinate with external agencies/authorities.	• Indian Navy • Coastguard
j. Be in constant touch with District and Local Administration for rescue and relief operation.	
k. CIC, once the DMP is activated and underway will ensure that, at frequent intervals, issue, through Radio and via the telephone and Media, situation reports and information updates.	
l. **Press Liaison** A press office will be set up and regular briefings organized and promulgated. The DC and representatives from each emergency service will attend as circumstances permit to brief media concerns. Where necessary, the P.R. teams from Port will be alerted to ensure fullest briefings on all aspects of the emergency.	
m. Terminate the response and debrief before allowing normal operation.	

NOTES ON SALVAGE:

- *If required inform a reputable Salvage Company;*
- *Thoughts should be given to adding ballast to secure vessel in bad weather;*
- *Secure topside openings;*
- *Topside survey;*
- *Underwater survey with a diver noting all damage on plan of vessel;*
- *Information on the seabed using diver and soundings;*
- *Based on survey, draft, stability, condition of vessel openings, cargo, fuel, water etc.,*

- *Other removable weights;*
- *Refloating plan must be agreed taking into consideration, draft, stability, a clear passage off (may have to dredge a channel); safety of personnel, fire, pollution (may have to remove bunkers and cargo);*
- *Availability of tugs, bunkering vessels, divers, salvage companies;*
- *CIC in control of salvage, Salvor in command, all plans approved by CIC.*

D. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency, proceed to the affected location & communicate& collect all necessary information's from the Master of the ship.	Dock Master
		Discuss with the Master or owner for refloating or salvaging of the vessel. Endeavour to obtain from owners/agents a General Arrangement Plan of the vessel and, if appropriate the Cargo Plan.	
		Gather information from Port Control Station regarding position and time.	
		He will report the situation to theCIC/CMG.	
		Activate Port DMP and OSCP.	
		Commence search and rescue operation immediately.	
		He will instruct Dock Master to keep tugs ready.	
		Alert other vessels within the vicinity and the movement of other vessels into, through and near the location should be stopped.	
		Assistance may be sought from other suitable and availablevessels.	
		Inform Salvage association and instruct Dock Master tocoordinate.	
		In the case of a capsized vessel, make arrangements to hold the	
		vessel in position if drifting would place her in grave danger and, on completion of rescue operations, secure the vessel in position or remove and secure her at some other safe location, whichever is safest and possible, until such time as salvage operations can be undertaken.	

Designated Officer	Role	Duties	Alternate Officer
		When clear to do so, arrange for the capsized or sunken vessel to be marked with appropriate buoy(s) and lights, to warn other vessels of her position.	
		Discuss with the Master, owner or agent plans for righting, refloating or salvaging the vessel. Action in this regard is particularly important where the vessel is obstructing fairways, channels or approaches to berths.	
		Ascertain oil pollution- leak source, if any.	
		Inform the MoEF & MPCB approved private parties for safe disposal and providing reception facilities for Oil/Sludge.	
Dock Master	Port Control Room Coordinator	Plot exact location of the incident.	Duty Supervisor
		Assist in monitoring of other vessels and communicating with the Master and restricting them to enter the emergency location.	
		Allow vessels directly involved in rescue operations within the vicinity.	
		Responsible for Organizing tugs for search and rescue.	
		Hire additional crafts as necessary.	
		Arrange for the marking arrangements with appropriate buoy(s) and lights.	
		Instruct the oil pollution response team to maintain a state of readiness and standby.	
		Assist Salvage association and SIC.	
		Liaise with the OSRO team and coordinate with the team in combating the disaster by taking necessary actions as per the OSCP.	
Pilot/ Marine Engineer	In Charge of Pilotage	Shall be ready for taking the instructions from CIC/SIC and evacuate/move/shift the vessel from the area.	Standby Pilot
		Shall monitor the communication on VHF & convey and relay messages on the advice from CIC/ SIC.	
		Responsible for organizing tugs for shifting the vessel to the anchorage area if required.	

Designated Officer	Role	Duties	Alternate Officer
Dy. Manager – Safety	Marine Pollution Control Coordinator	Shall take orders from the SIC.	Safety Inspector
		Extend all necessary support to the Master of the vessel for search and rescue operation.	
		Make arrangements for oil pollution combat personnel and equipment.	
		Coordinate with the party involved in disposal of the Oil/sludge in a safe manner.	
		Supervise and direct personnel to follow the instructions given by SIC.	
		Report to SIC and seek advice if in doubt.	
		Maintain records of the claims.	
Asst. Manager (Fire & Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Mobilize fire tenders, men & firefighting equipment to the scene & extend all necessary support to the master of the vessel for firefighting.	
		Coordinate with the party involved in disposal of the Oil/sludge in a safe manner.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first-aid team ready with ambulance & necessary medicines to attend to any injured person.	Alternate Officer
Chief Manager (PP&D)	Civil Coordinator	Inform MPCB as per the instruction of CIC/SIC and other environmental agencies about the incident for getting necessary guidance.	Manager(I, II)
		Instruct the contractors to carry out urgent civil works as required.	
		Hire the barges for collecting the spilled oil and coordinate with the parties involved in the safe disposal of the oil/sludge.	
Chief Manager (Traffic)	Traffic Coordinator	Coordinates with ship owners/agents/ stevedores.	Asst. Manager (Traffic)
		Regulate water traffic in the vicinity	
Sr. Commandant -CISF	Security and Evacuation	Controls & direct traffic in the area.	Dy. Commandant-CISF
		Shall cordon off the area.	
		Shall supervise evacuation of personnel from the scene at the time of emergency.	
		Allow vehicles which are directly involved in rescue operations within the vicinity of the rescue operations.	

Scenario 12 - Emergency/Disaster within the facility (Reliance/IMC/GBL/Deepak Fertilizer/Suraj Agro/IOCL/Bharat Shell tank farms)

1. **Precautions:** MSDS, SOP, House Keeping,

2. **Impact Zone:** Facility area and neighboring facility/facilities.

3. **Resources required:** As per facility DMP.

4. **Action Plan**

   A. Activate facility EAP.
   B. Alert staff within the facility as well as the neighboring facility.
   C. Inform Port signal station and CIC/SIC.
   D. Inform neighboring and mutually aid partners.
   E. Gather as much information as possible pertaining to the nature and scope of the impending or possible emergency.
   F. Assist and advice the external Emergency services as appropriate.

If there is a potential to affect other Port operators

A. Notify CIC/SIC/Signal Station as appropriate and seek help.
B. Notify neighboring facilities as appropriate and seek help.

Scenario 13 - Fire in CFS - Warehouse

1. **Precautions:** Protected/covered Electrical installations, Firefighting systems,trained personnel to combat fire, No smoking zone, House Keeping.

2. **Impact Zone:** Warehouse and immediate area.

3. **Resources required:** Organizational setup enumerated in Figure S13.2.

Figure S13.1: Action Flow Chart

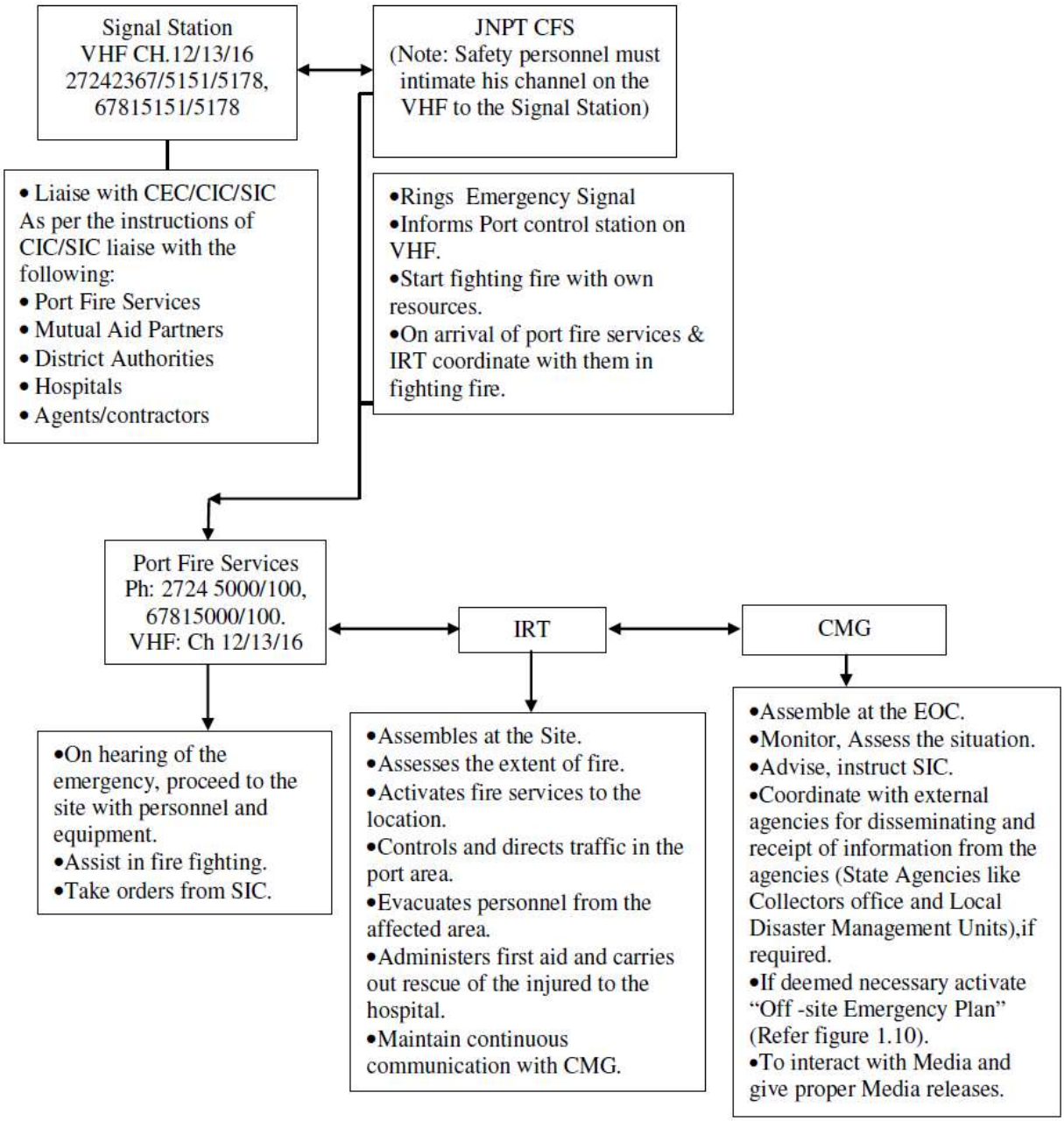
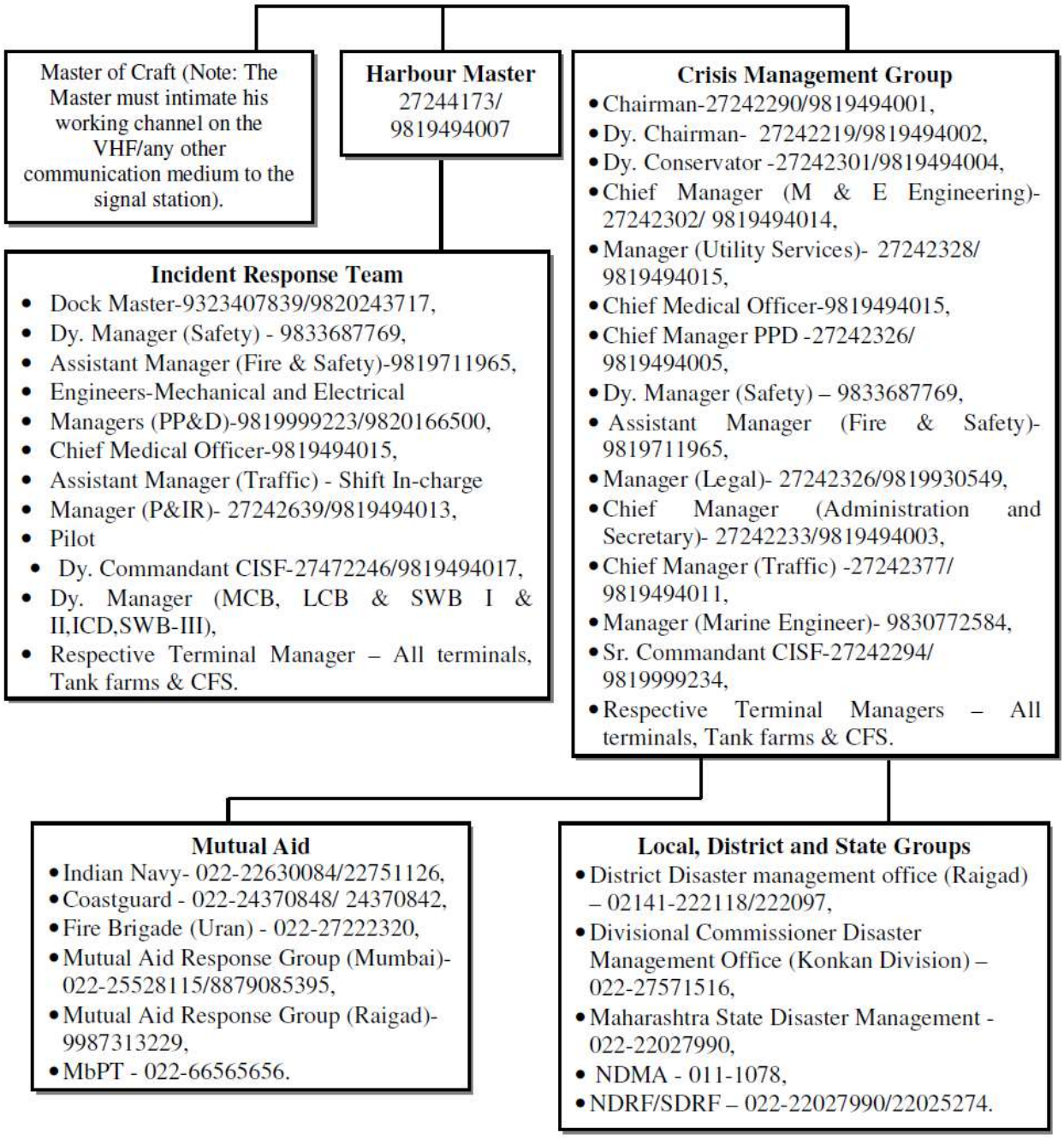


Figure S13.2: Action group



4. Action Plan

A. The safety personnel of CFS

Response Action	Contact
a. Should raise emergency alarm and activate emergency action plan.	
b. Vehicles in the vicinity and Port should be informed of any incident without delay.	• Vehicles in the vicinity • Port Control Station
c. Shall be responsible for fighting the fire with own resources as well as with the available support from IRT.	

B. Port Control Station should

Response Action	Contact
a. Gather information related to the fire and time ofincident.	
b. Notify to CIC and SIC.	• CIC • SIC
c. Gather information about the wind direction and notify CIC/SIC.	• CIC • SIC

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Coordinate with external agencies/authorities.	• Local Authorities
f. Be in constant touch with District and Local Administration for rescue and relief operation.	
g. Terminate the response and debrief before allowing normal operation.	

D. The Fire-fighting Personnel (F &ASO-I) should (Alternate: F &ASO-II)

Response Action	Contact
a. Collect the information from Port Control Station andSIC.	• SIC • Port Control Station
b. Assist CFS in fighting fire.	
c. He will mobilize firefighting tenders, personnel & firefighting equipment to the scene & extend all necessary support in case of fire, if required.	
d. Assist in evacuation of the personnel as directed by SIC.	
e. Inform SIC for arrangement of any additional equipment as required.	

E. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceedto the scene & communicate & collect all information.	Dock Master
		Assess and report the situation to the CIC/CMG.	
		Extend all necessary support tofight the fire.	
		He will instruct the Asst. manager (Fire and Safety) to keep the fire- fighting equipment and firefighting tenders in a state of readiness & activate if required.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC/SIC.	Duty Supervisor
		Assist SIC and maintain Log ofevents.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders for SIC.	Safety Inspector
		Ensure safely rescue of personneland labors.	
		Ensure cleanup work during and after the emergency as quick as possible.	
Sr. Commandant -CISF	Security and Evacuation	Controls & directs traffic in thearea.	Dy. Commandant-CISF
		Cordon off the area.	
		Shall supervise evacuation of personnel from the scene at the time of emergency.	
Chief Manager (PPD)	Civil Coordinator	Liaise with SIC.	Manager(I, II)

Designated Officer	Role	Duties	Alternate Officer
Chief Manager (Mechanical & Electrical)	In-charge of Electrical Installation	Shall be responsible for Electrical supply to vital equipment and systems.	Asst. Engineer
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
Chief Manager (Traffic)	Traffic Coordinator	Shall mobilize and dispatch sufficient number of vehicles to the site of emergency. Coordinates with SIC/CIC.	Asst. Manager (Traffic)

Scenario 14 - Fire in Port Administration building/PUB/Customs House/Port Operation Centre

1. **Precautions:** Smoke and Fire Detection system, Firefighting system, trained personnel to combat fire, No Smoking zone, and Protected/covered Electrical installations.

2. **Impact Zone:** Administration building/PUB/Customs House/Port Operation Centre.

3. **Resources required:** Organizational setup enumerated in Figure S14.2.

Figure S14.1: Action Flow Chart

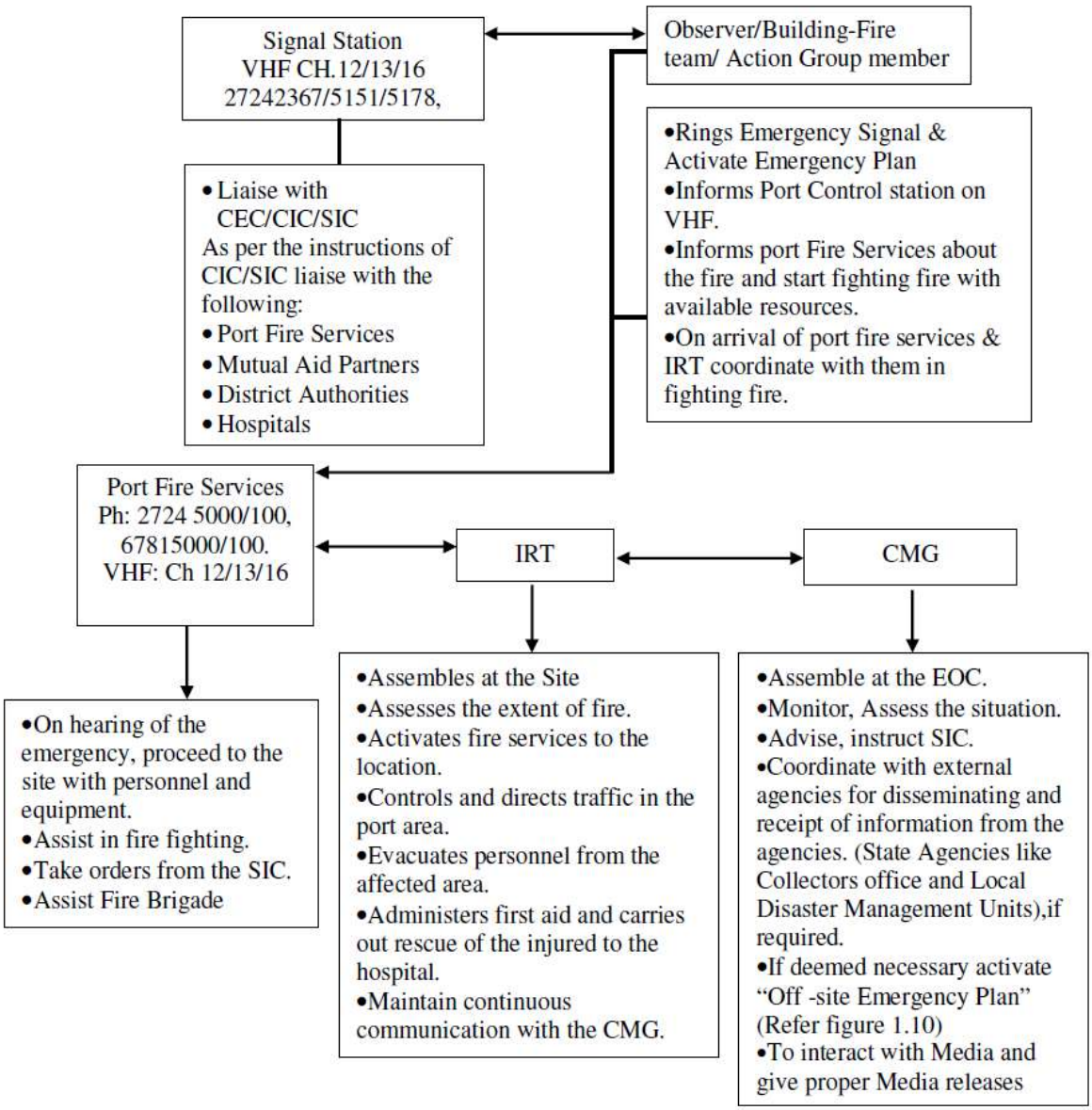
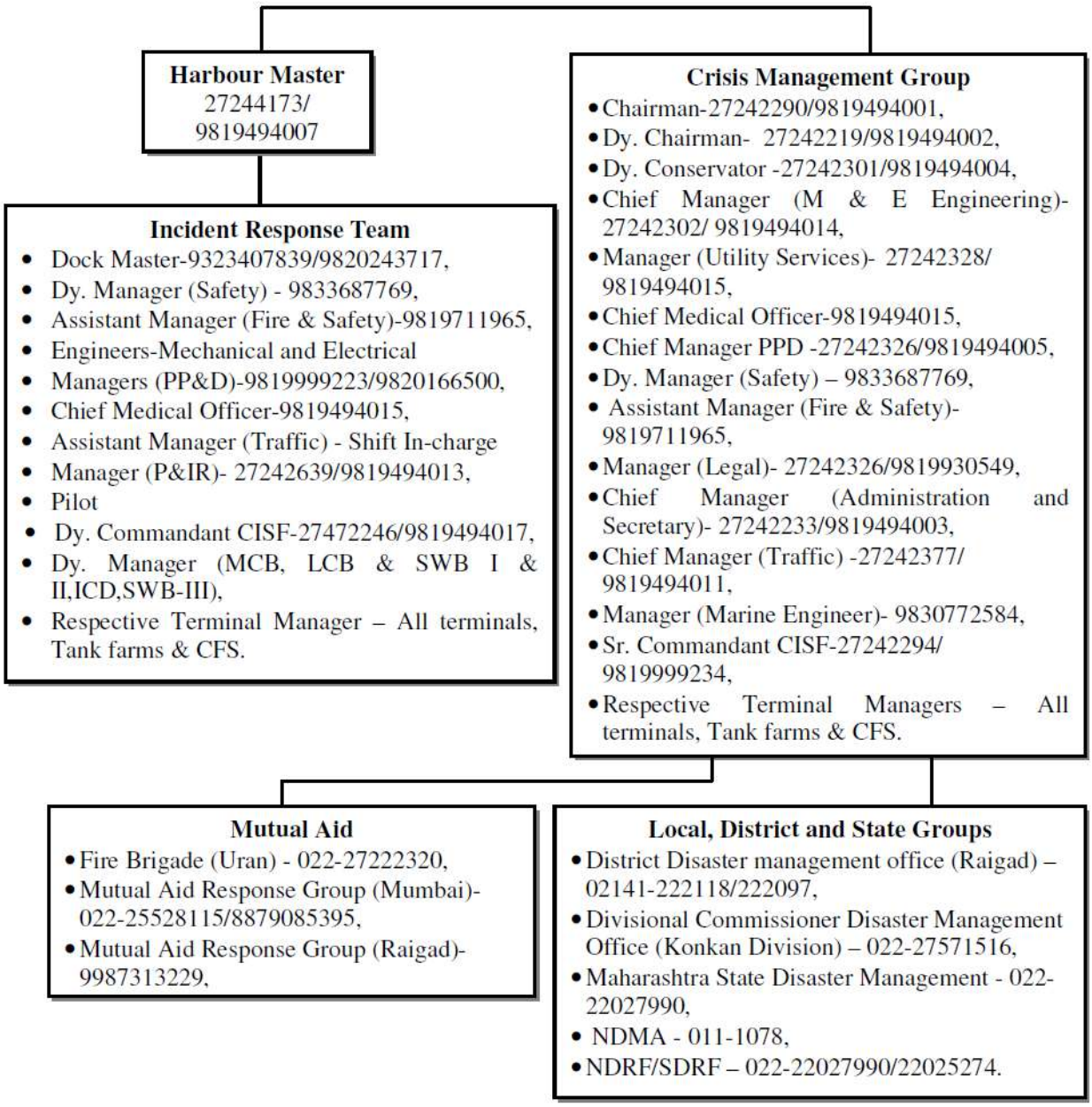


Figure S14.2: Action Group



4. Action Plan

A. The Observer/ Building-Fire team/ Action Group member

Response Action	Contact
a. Shout "Fire Fire Fire" and should raise alarm.	
b. Port Control Station should be informed of any incident without delay.	• Port Control Station
c. If fire is in the Port Control Station , inform F &SO and SIC	• F & SO • SIC
d. If trained, try to extinguish the fire and try to evacuate people.	

B. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the level of disaster and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Assess the condition of site take decision on evacuation in consultation with SIC.	
f. Be in constant touch with District and Local Administration for rescue and relief operation.	
g. Terminate the response and debrief before allowing normal operation.	

C. The Fire-fighting Personnel (F& ASO –I) (Alternate : F& ASO –II) should

Response Action	Contact
a. Raise Alarm (siren)	
b. Collect the information about the exact location of the fire and people trapped in the building. Ensure safe evacuation of the people in the affected area to a safe location.	
c. He will lead the team and mobilize fire tenders, personnel & firefighting equipment to the scene & extinguish the fire.	
d. If the fire is out of control, convey the message to CIC/SIC and seek assistance from Mutual aid partners or other organizations.	• CIC • SIC
e. Open the water curtain valve to protect shore installations from heat radiation.	
f. Control cleanup work during and after the emergency as quick as possible.	

Response Action	Contact
g. If the fire is under control and extinguished, give all clear signal	

D. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information.	Dock Master
		Assess and report the situation to the CIC/CMG.	
		Instruct the Asst. Manager (Fire & Safety) to keep the fire-fighting equipment in a state of readiness &activate if required.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC/SIC.	Duty Supervisor
		Maintain Log of events.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Shall take orders from the SIC.	Safety Inspector
		Ensure safe evacuation of the people in the affected area to a safe location.	
		Control cleanup work during and after the emergency as quick as possible.	
Sr. Commandant -CISF	Security and Evacuation	Shall supervise evacuation of personnel from the scene at the time of emergency.	Dy. Commandant-CISF
		Cordon off the area.	
		Coordinate with Police and FireBrigade.	
Chief Manager (PPD)	Civil Coordinator	Assist SIC.	Manager(I, II)
Chief Manager (Mechanical &Electrical)	In-charge of Electrical Installation	Shall be responsible for Electrical supply to vital equipment andsystems.	Asst. Engineer
Chief Manager (Traffic)	Traffic Coordinator	Provide necessary assistance toCIC/SIC.	Asst. Manager (Traffic)
		Shall mobilize and dispatch sufficient number of vehicles to the site of emergency.	
		Control and Directs Traffic in the affected area.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person.	Alternate Officer
Duty Pilot	In-Charge of Pilotage	Shall be ready for providing any assistance on site.	Standby Pilot

Scenario 15 - War and Terrorism

1. **Precautions:** Trained Security Personnel, CCTV and Continuous Vigilance including radioactive detectors and intelligence from designated local and nationalagencies.

2. **Impact Zone:** Entire port.

3. **Resources required:** Intelligence inputs from agencies and organizational setup enumerated in Figure S15.2.

4. **Action Plan**

When war like situation is developed or during the declaration of war the priority is to be given to all important/critical areas to remain vigilant to prevent sabotage, toremain ready to combat emergency and to keep normal operation going.

A. Prior Emergency Situation (after warnings/inputs)

- Set up Crisis management center and manned continuously.
- CMG to declare plan/guideline to be followed which could be based on CISF Contingency Plan/Government of India/Statutory bodies/Indian Navy/Air Force/Government of Maharashtra etc. instructions.
- CMG to ensure utmost vigilance in identified area to ensure the adequate resources in terms of security personnel, experts in handling equipment, trained manpower, and flood lights, earth moving equipment, mobile cranes, and rescue crafts are available to guard all gates, roads etc. In case of any unidentified/unauthorized person is found, he must be handed over to police.
- CMG to ensure that evacuation plan is prepared and backup systems such as power generator, communication equipment, and safety systems are working. CMG should also ensure that all required manpower such as electricians/technicians/laborer is available all time.
- All terminals should be informed.
- No movement of the vessels in the port vicinity will be allowed.

B. During Emergency

- CMG to adopt relevant DMP to combat the emergency.
- In case of an enemy attack inform relevant authorities & internal security to defend installations till the external support arrives.
- When additional security (army/BSF) arrives, situation is to be handled jointly.
- CMG to ensure sufficient supply of food and water.
- All vessels inside the port and at the anchorage will observe blackout as per the instruction of CMG.

Figure S15.1: Action Flow Chart

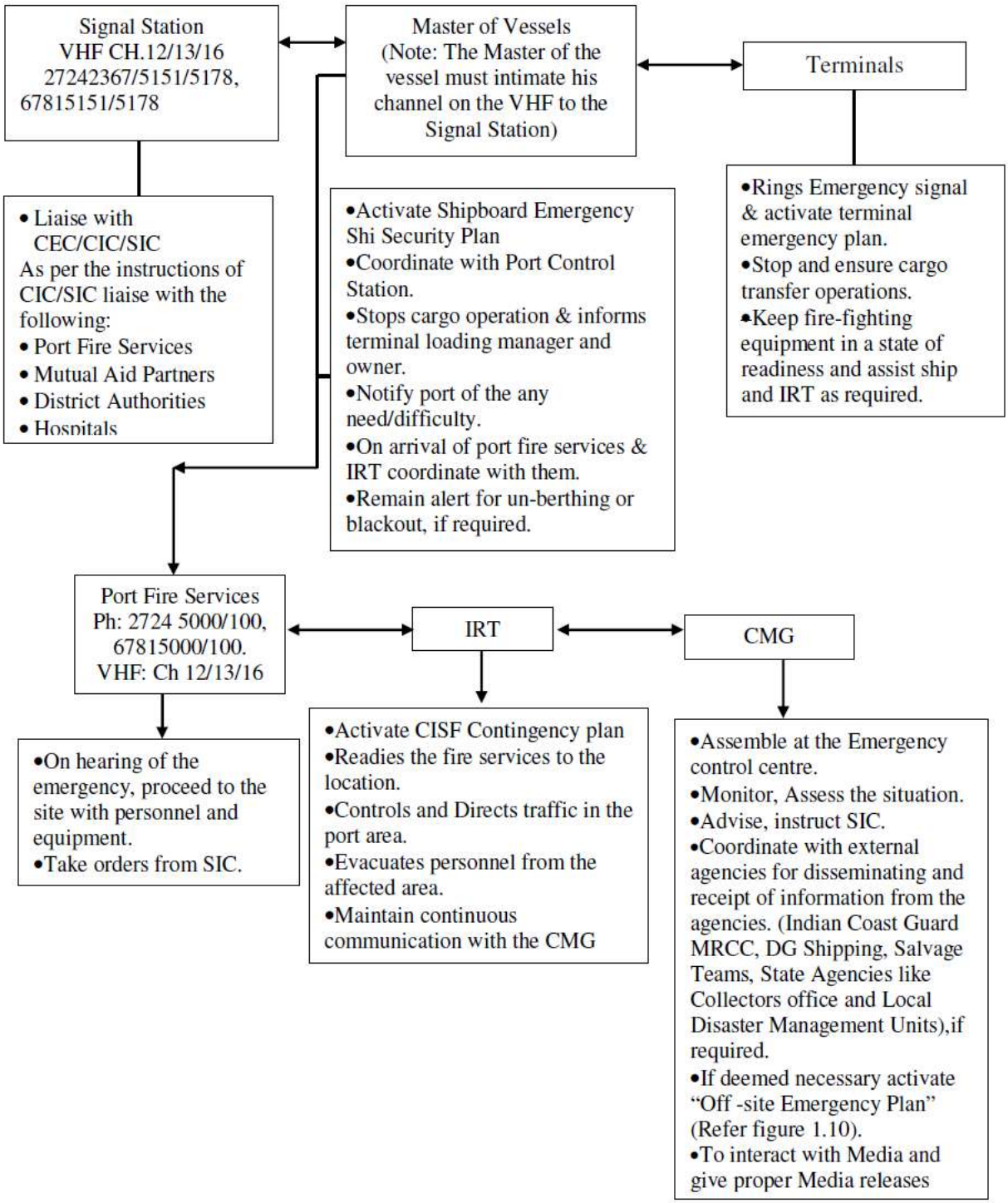
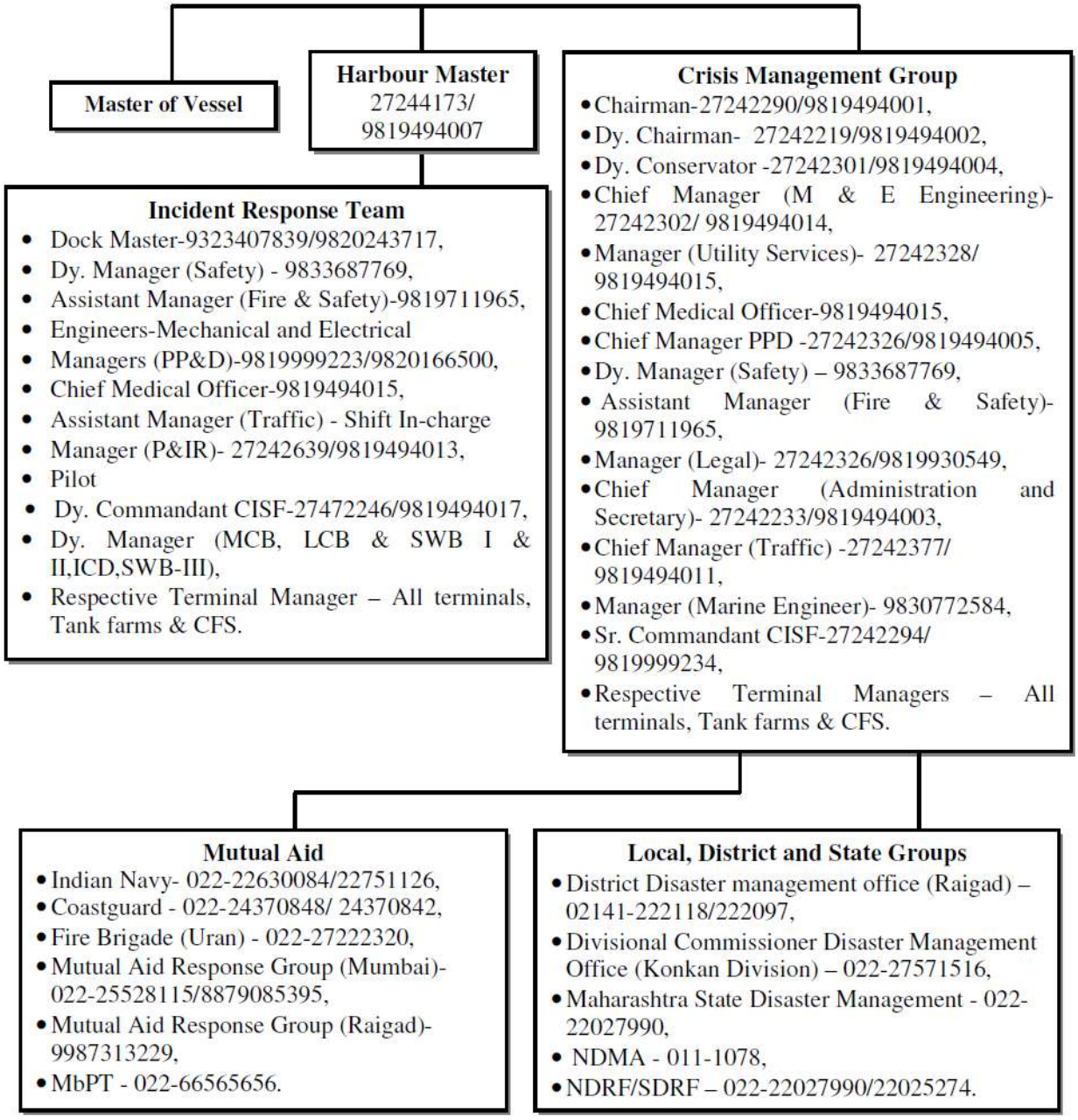


Figure S15.2: Action group



5. Action Plan

A. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the situation and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Be in constant touch with District and Local Administration for rescue and relief operation.	
f. Terminate the response and debrief before allowing normal operation.	

B. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall communicate & collect all information.	Dock Master
		Report the situation to the CIC/CMG.	
		Extend all necessary help to CISF as and when required.	
		Ensure that there is blackout at the port and the vessels at the anchorage area as per the guidanceand instruction of CMG/CIC.	
Dock Master	Port Control Room Coordinator	Shall be ready for taking the instructions from CIC/SIC and evacuate/move/shift the vessel from the area.	Duty Supervisor
Master of the vessel	In-Charge of firefighting operation on board vessel	Be ready to take the vessel out of the port as per the instructions of CIC/SIC.	Chief Officer of vessel
		Coordinate with IRT leader and will be responsible for shutting down all cargo operation on board in coordination with terminal In-Charge.	
Terminal Managers	Cargo Work	Shall be responsible of shutting down of cargo operation & coordinating with JNPA and rendering necessary assistance to the SIC by providing additional firefighting & emergency equipment as required.	Assistant Terminal Manager

Designated Officer	Role	Duties	Alternate Officer
		Arrange to protect cargo in vicinity from damage.	
		Submits consolidated list of dangerous goods in port – Vessels in port.	
		Coordinates with ship in-charge/C & F agents/stevedores.	
Asst. Manager (Fire & Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Keep the fire –fighting installation in a state of readiness and be in continuous liaise with SIC/CIC.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Ensure all employees (port and contract) within port shifted to safelocations.	Safety Inspector
Sr. Commandant -CISF	Security and Evacuation	Act as per the CISF Contingencyplan.	Dy. Commandant -CISF
		Controls & Directs traffic in thearea.	
		Shall supervise evacuation of personnel from the scene at the time of emergency.	
Sr. Manager (PPD)	Civil Coordinator	Assist SIC.	Manager(I, II)
Chief Manager (Mechanical &Electrical)	In-charge of Electrical Installation	Arrange for specialized equipment if required as per the instruction ofthe SIC.	Asst. Engineer
		Take orders from CIC/SIC with regards to power supply and shutdown.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
Berth Managers	Traffic Coordinator	Shall prepare vessels to vacatefrom berth.	Dy. Manager - Berths
		Arrange to protect cargo in vicinity from damage.	
		Submits consolidated list of dangerous goods in port – Vessels in port.	
		Coordinates with ship owners/agents/ stevedores.	
Chief Manager (Traffic)	Traffic Coordinator	Submits consolidated list of dangerous goods in port-tankfarms in port area.	Asst. Manager (Traffic)
		Coordinates with the tank truckcontractors.	
		Ensure sufficient numbers of vehicles are available.	
		Controls traffic in the JNPA area.	

Designated Officer	Role	Duties	Alternate Officer
Duty Pilot	In-Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugsfor shifting the vessel to the anchorage area.	Sr. Dy. Manager (Marine Engg.)

Scenario 16 - Bomb Threat

1. **Precautions:** Trained Security Personnel, CCTV and Continuous Vigilanceincluding radioactive detectors.

2. **Impact Zone:** Entire port

3. **Resources required:** Organizational setup enumerated in Figure S16.2.

Figure S16.1: Action Flow Chart

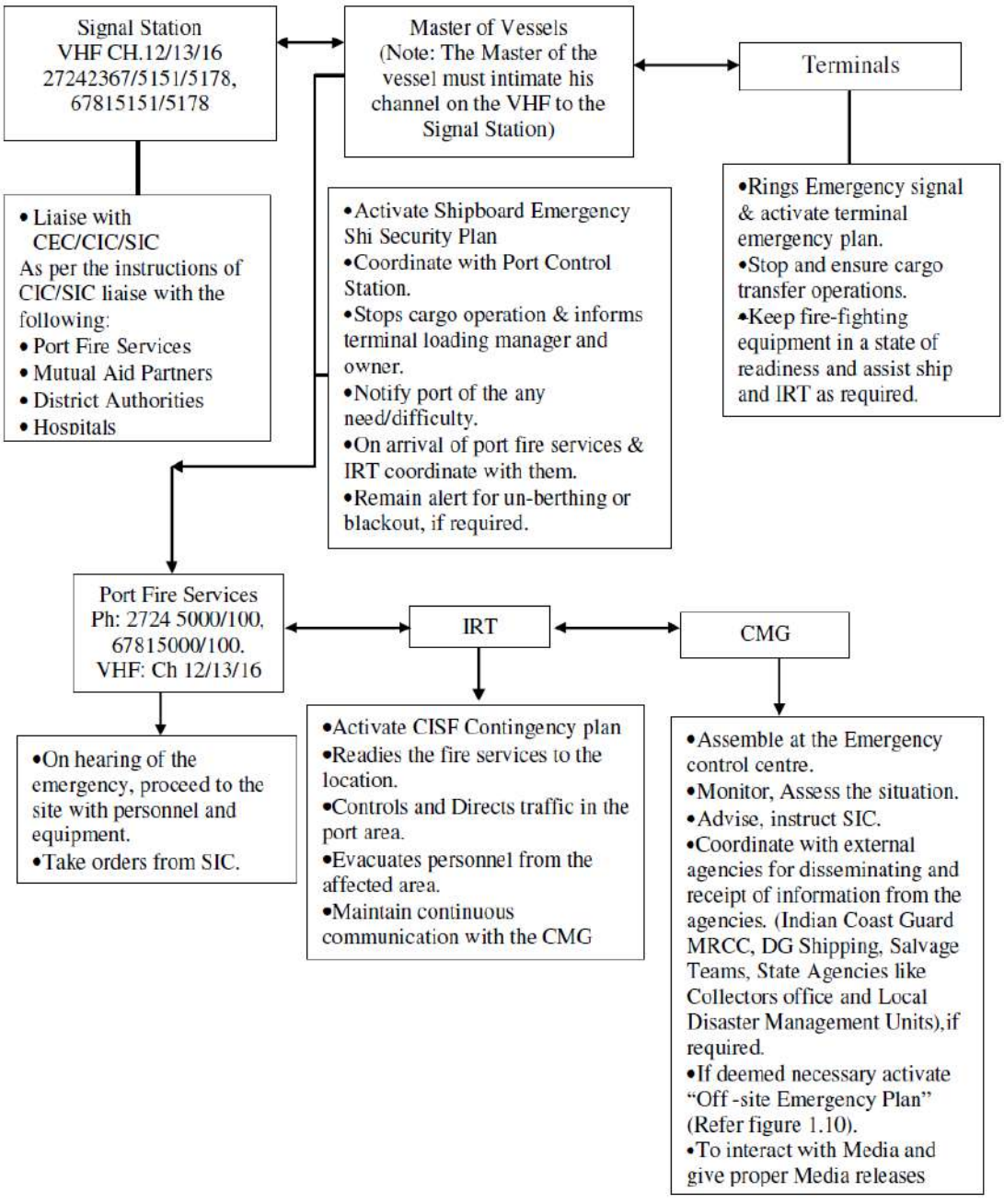
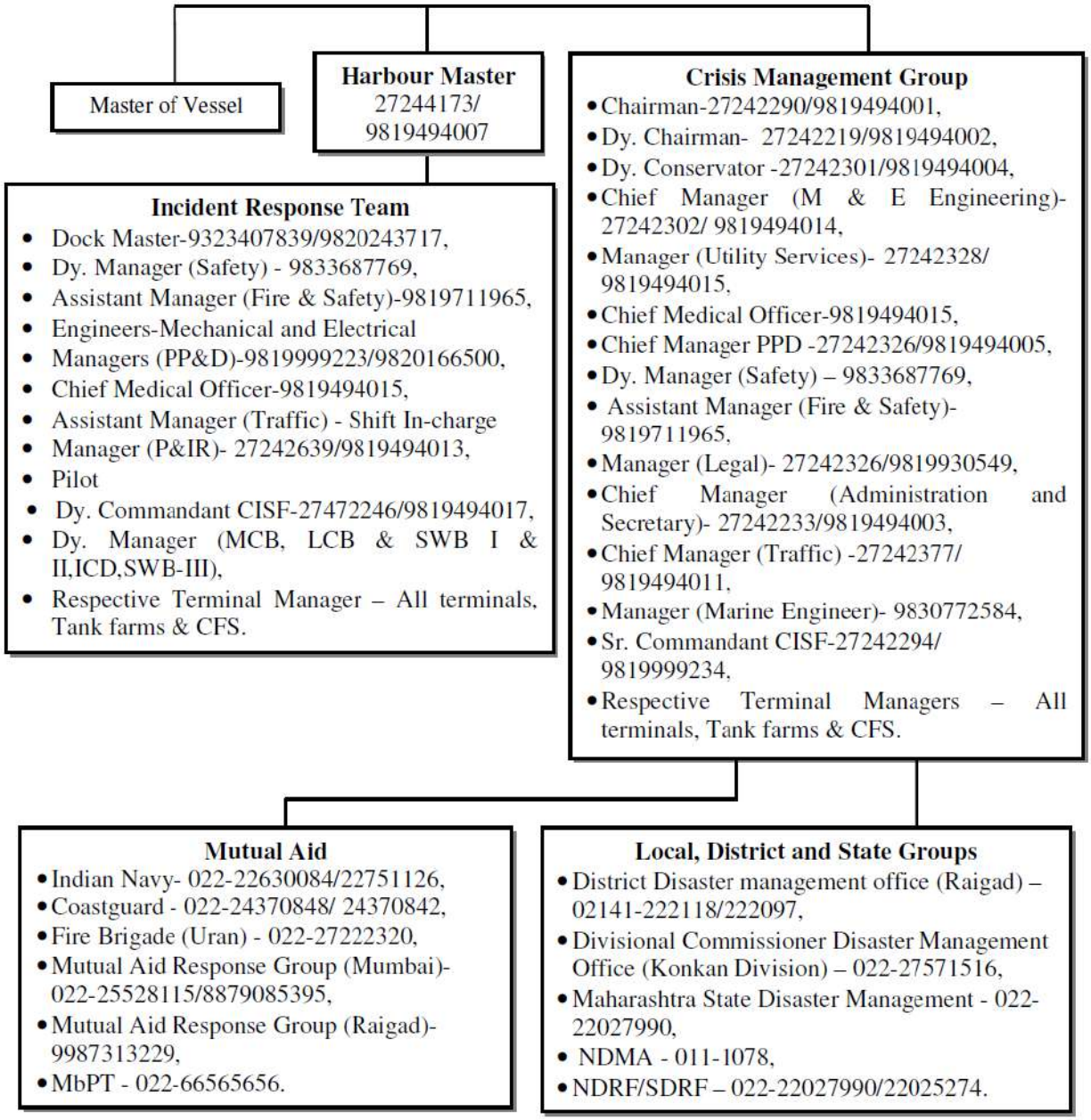


Figure S16.2: Action group



4. Action Plan

A. The Observer

Response Action	Contact
a. Port Control Station/CISF should be informed withoutdelay.	• Port ControlStation

B. CISF Should

Response Action	Contact
a. Gather the information as per CISF bomb threat checklist.	
b. Should Implement/activate CISF Contingency Plan and search operation as per the message received of the location.	
c. Identify the location and cordon off the area.	
d. Assist District Police and Bomb Squad as required.	
e. All terminals should be informed.	
f. Port should be shut down and people inside the port should be taken to a safe location.	

C. Deputy Conservator (Alternate: Harbour Master)

Response Action	Contact
a. Assess the situation and activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC, CISF and Port Control Station & arrange for external aid as necessary.	• SIC • CISF • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Be in constant touch with District and Local Administration for rescue and relief operation.	
f. Terminate the response and debrief before allowing normal operation.	

D. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall communicate & collect all information.	Dock Master
		Ensure that the identified location is cordoned off and the people are evacuated.	
		Report the situation to the CIC/CMG.	
		Extend all necessary help to CISF as and when required.	
Dock Master	Port Control Room Coordinator	Shall be ready for taking the instructions from CIC/SIC and evacuate/move/shift the vessel from the area.	Duty Supervisor
Master of the vessel	In-Charge of firefighting operation on board vessel	Be ready to take the vessel out of the port as per the instructions of CIC/SIC.	Chief Officer of vessel
		Coordinate with IRT leader and will be responsible for shutting down all cargo operation on board in coordination with terminal In-Charge.	
Terminal Managers	Cargo Work	Shall be responsible of shutting down of cargo operation & coordinating with JNPA and rendering necessary assistance to the SIC by providing additional firefighting & emergency equipment as required.	Assistant Terminal Manager
		Arrange to protect cargo in vicinity from damage.	
		Submits consolidated list of dangerous goods in port – Vessels in port.	
		Coordinates with ship in-charge/C & F agents/stevedores.	
Asst. Manager (Fire & Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Keep the fire –fighting installation in a state of readiness and be in continuous liaise with SIC/CIC.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Ensure all employees (port and contract) within port shifted to safe locations.	Safety Inspector
Sr. Commandant - CISF	Security and Evacuation	Act as per the CISF Contingency plan.	Dy. Commandant - CISF
		Controls & Directs traffic in the area.	
		Shall supervise evacuation of personnel from the scene at the time of emergency.	
Sr. Manager (PPD)	Civil Coordinator	Assist SIC.	Manager (I, II)

Designated Officer	Role	Duties	Alternate Officer
Chief Manager (Mechanical & Electrical)	In-charge of Electrical Installation	Arrange for specialized equipment if required as per the instruction of the SIC.	Asst. Engineer
		Take orders from CIC/SIC with regards to power supply and shutdown.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person at the site of the accident.	Alternate Officer
Berth Managers	Traffic Coordinator	Shall prepare vessels to vacate from berth.	Dy. Manager - Berths
		Arrange to protect cargo in vicinity from damage.	
		Submits consolidated list of dangerous goods in port – Vessels in port.	
		Coordinates with ship owners/agents/stevedores.	
Chief Manager (Traffic)	Traffic Coordinator	Submits consolidated list of dangerous goods in port-tank farms in port area.	Asst. Manager (Traffic)
		Coordinates with the tank truck contractors.	
		Ensure sufficient number of vehicles is available.	
		Controls traffic in the JNPA area.	
Duty Pilot	In-Charge of Pilotage	Shall be ready on site for taking the ship out of berth and be ready for providing any assistance on site.	Standby Pilot
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for shifting the vessel to the anchorage area.	Sr. Dy. Manager (Marine Engg.)

Scenario 17 - Natural Disaster (Cyclone, Earthquake, Flood, Tsunami)

1. **Precautions:** Continuous weather monitoring, Early warning system.
2. **Impact Zone:** Entire port.
3. **Resources required:** Refer Figure S17.2.

Figure S17.1: Action Flow Chart

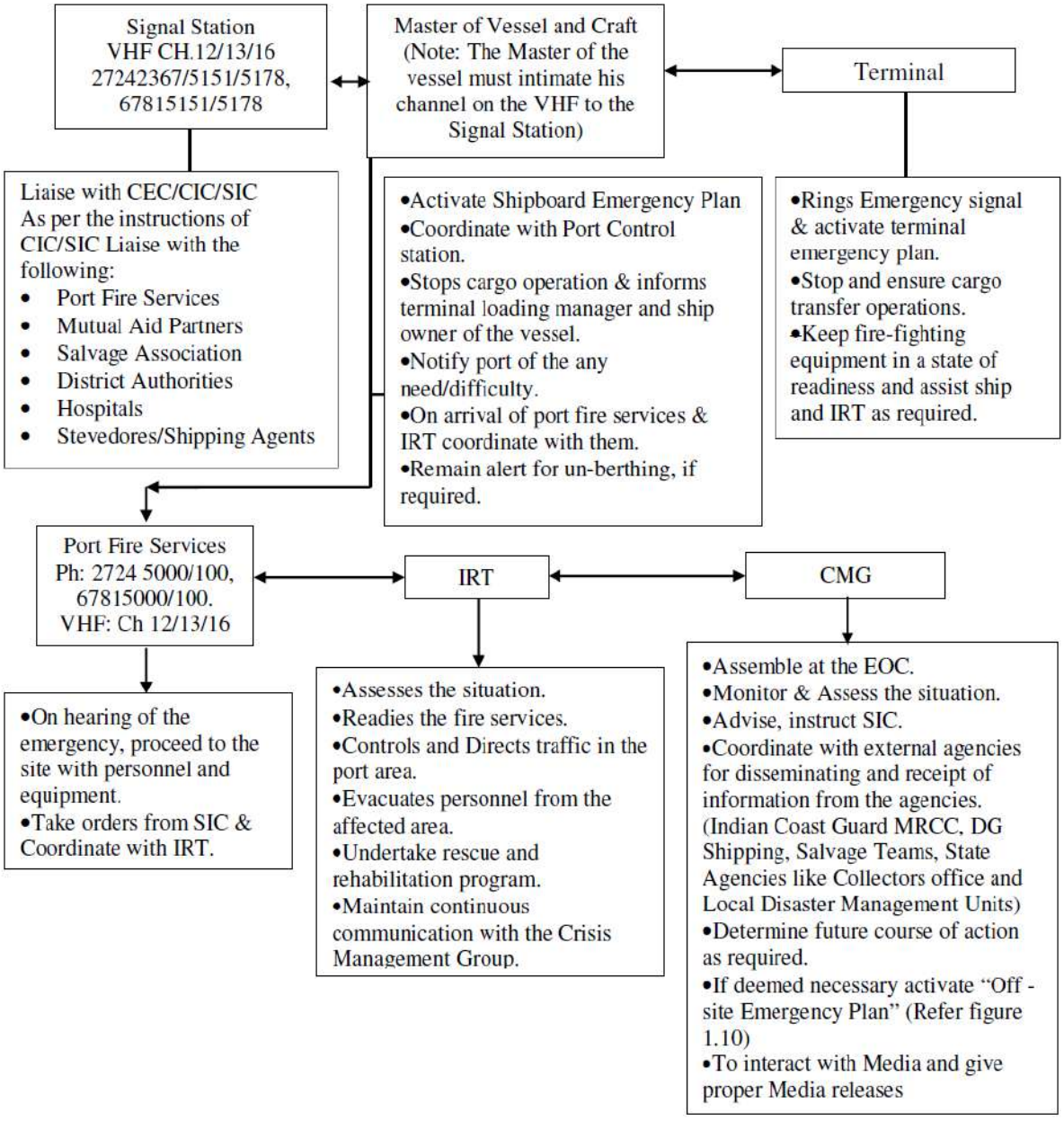
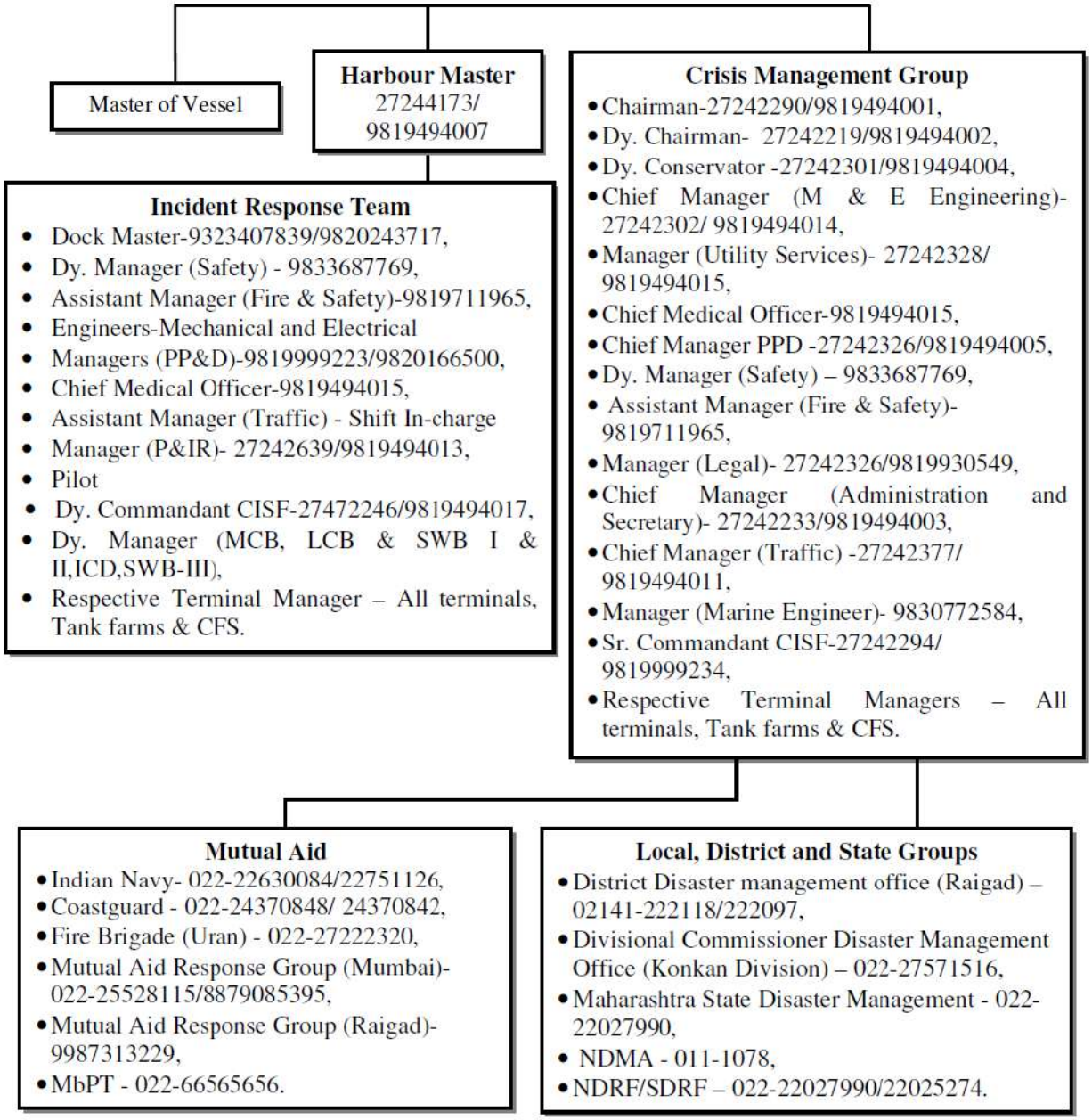


Figure S17.2: Action group



4. Action Plan

A. The Port Control Station

Response Action	Contact
a. Gather information related to the vessel type and position in the port limit.	
b. Gather information related to the weather conditions by liaising with competent agencies for issuing warnings as mentioned in section 9.2.3 and other media. Monitor the weather map either through Internet or Television and record approximate position of the weather and information about its movement as given in the news.	
c. Liaise with Master of the Vessel/Pilot.	
d. Ensure that both IT and Civil telephones, one VHF and one walkie-talkie all are operational in the Port control center. Communication to be maintained on VHF channel-13.	
e. Notify to CIC, SIC and the vessels moving into, through and inside the port. Keep CIC/SIC informed of all the messages received by telephone, VHF sets or by messenger.	• CIC • SIC
f. Notify the other Authorities and stakeholders within Port as per instructions of CIC/SIC.	• Navy • Coastguard • Stakeholders
g. Notify the information to the owner of the vessel as per the instruction of CIC/SIC/ Master of the Vessel. Pass the information to various Port departments and other Port related organizations through telephones and VHF.	• Terminal Operators
h. Inform the Dock Master/Marine Engineer of any buoys or crafts or any Port installation is seen adrift.	• Dock Master • Marine Engineer
i. Hoist signals or raise alarms, as per the warnings received by the competent agencies for issuing warnings. (for warning signals refer section 9.2.3)	
j. On behalf of Chairman/Dy. Chairman, the control center should liaise with Revenue/Police/Health. Administration/Municipal Corporation for additional assistance.	

B. The Master of the Vessel (Alternate : Chief Officer)

Response Action	Contact
a. Should raise ships emergency alarm and activate ship board emergency action plan.	
b. Having raised the alarm, the Master will be responsible for taking all immediate steps to safeguard his ship.	
c. The Master will provide the Port Authority with details of the vessel.	• Port Control Station
d. Should follow the instruction of the CIC/SIC and be in continuous liaise with the CIC/SIC/Port control station.	• CIC • SIC • Port Control Station
e. Should be in a state of readiness to take the vessel out of the port.	

C. The terminal personnel should

Response Action	Contact
a. Activate EAP (prepared by the terminal) and informJNPA.	• Port Control Station
b. Shall be responsible of shutting down of cargo operation (as per Terminal SOP) & coordinate with JNPA and Master of the Vessel and rendering necessary assistance to the SIC and vessel by providing emergency equipment as required.	
c. Submit consolidated list of dangerous goods in port – Vessels in port. Make arrangements to protect cargo.	
d. Assist IRT and provide all necessary equipment.	• SIC
e. He will direct operation staff. Coordinate with the ship in-charge/C&F agents/stevedores.	

D. Deputy Conservator

Response Action	Contact
a. Activate the DMP.	
b. Establish EOC and be stationed to review & assess possible developments to determine the most necessary course of action.	
c. Give necessary instructions to SIC and Port Control Station & arrange for external aid as necessary.	• SIC • Port Control Station
d. Review the situation and accordingly inform to the Chairman/ Dy. Chairman.	• Chairman • Dy. Chairman
e. Consult with Chairman / Dy. Chairman and decide on clearing of ships as soon as the cyclone is confirmed to pass in close proximity to the Port.	

Response Action	Contact
f. Plan movements of vessels such that the vessels are cleared in shortest possible time.	
g. Coordinate with external agencies/authorities such as Indian Navy and Coastguard.	• Indian Navy • Coastguard
h. Be in constant touch with District and Local Administration for rescue and relief operation.	
i. Terminate the response and debrief before allowing normal operation.	

E. Duties of IRT

Designated Officer	Role	Duties	Alternate Officer
Harbour Master	Site Incident Controller	During Emergency shall proceed to the scene & communicate & collect all information.	Dock Master
		Take over the charge of control center and ensure the action plan is promulgated as per the instructions of CIC.	
		Inform and ask Masters to keep their ships ready to proceed to the sea at short notice as per the instruction of CIC.	
		Ensure port control, hoists appropriate storm signal as per the situation.	
		Report the situation to the CIC &the CMG.	
		Keep rescue team ready with rubber boats, Life jackets etc.	
		Inform ships alongside berths to double up their moorings and provide shore gang assistance.	
		Ensure that the hazardous cargoes are shifted out of the port or secured/stored in a safe manner.	
		Ensure that the operations arebrought back to normal after the termination of the emergencyprocedure.	
Dock Master	Port Control Room Coordinator	Shall monitor the communication on VHF/any other communication medium & convey and relay messages on the advice from CIC/SIC.	Duty Supervisor
		Instruct Marine engineers to secure tugs and workboats.	
		He will maintain LOG of events.	
Asst. Manager (Fire & Safety)	Fire Coordinator	Shall take orders from the SIC.	Station Officer
		Keep fire tenders and fire-fighting equipment in a state of readiness.	

Designated Officer	Role	Duties	Alternate Officer
		Ensure the Fire tugs is properly manned and secured with double ropes and engines running in idling condition.	
		Responsible for mobilizing fire tenders, men & firefighting equipment to the scene & extend all necessary support.	
		Ensure hazardous cargo out are kept at a sheltered or safe location.	
		The port Fire & Safety Officer will make announcement in the township and the adjoining habitats area indicating the precautionary measures to be taken.	
		Liaise with State Fire brigade for any assistance.	
Dy. Manager (Safety)	Marine Pollution Control Coordinator	Ensure workers within perimeter of safety dangerous / chemical tank farms shifted to safer perimeters.	Safety Inspector
		All other workers to move out of port area.	
Sr. Commandant -CISF	Security and Evacuation	Controls & Directs traffic in the area.	Dy. Commandant-CISF
		Shall supervise evacuation of personnel from the scene at the time of emergency.	
		Ensure that all barges / small vessels are directed to go to the sheltered area.	
		The fishing trawlers and fishing crafts to be sent to safer place.	
		Till normality is restored, arrangement will be made for thorough checks on all out-going vehicles to guard against pilferage.	
		Round the clock patrolling duty shall be introduced along the electric lines to guard against the removal of copper wires which are likely to be grounded during cyclone.	
		A special task force to be set up by the CISF for the rescue operation.	
Chief Manager (Traffic)	Traffic Coordinator	Submits consolidated list of dangerous goods in port-tank farms in port area.	Asst. Manager (Traffic)
		Coordinators with the tank truck contractors.	
		Ensure availability of vehicles and mobilize and dispatch sufficient number of vehicles to the site during emergency.	
		Controls traffic in the JNPA area.	
Chief Manager (PPD)	Civil Coordinator	All types of cranes, forklifts, heavy earth moving equipment to be secured in a safe manner.	Manager(I, II)

Designated Officer	Role	Duties	Alternate Officer
		Keep enough number of cement bags ready as per SIC instructions.	
		Diesel engines for raw water and clean water, all pump house equipment and all generator sets meant for water supply shall be tried out and kept ready.	
		As soon as the contingency plan is made operational all the water tanks should be filled up and standby arrangement for supply of water to be made.	
Chief Manager (Mechanical &Electrical)	In-charge of Electrical Installation	Shall be responsible for Electrical supply to vital equipment and systems at the berth.	Asst. Engineer
		All Sub Stations, Power Control rooms will be manned round the clock.	
Sr. Dy. Chief Medical Officer	Medical Coordinator	Shall be responsible to organize and keep first aid team with ambulance & necessary medicines to attend to any injured person.	Alternate Officer
Duty Pilot	In-Charge of Pilotage	Shall be ready on site for taking the ship out of berth or will not bring the ship to berth as per the instruction given by CIC/SIC.	Standby Pilot
		Inform the Masters of all vessels at the berths to double the moorings and to keep engine ready to proceed out to sea if situation warrants.	
		Decision regarding moving ships to the anchorage will be taken depending on the strength of the wind likely to be encountered and number of vessels in the Port.	
		Maintain a close liaison and co- ordination with the Operations In- charge.	
		Take all necessary steps for the safety of the Port crafts.	
		Ensure all other crafts are placed at safe place and properly secured excepting one pilot launch and one stand by launch used for inspection and emergency duties.	
		Ensure all barges will be secured at safe place along with emergency squad will make frequent round (minimum two hourly) to check the safety of Port Crafts.	
		Fender and extra lengths of ropes/wires will be kept ready so as to attend to any craft whose moorings may part.	

Designated Officer	Role	Duties	Alternate Officer
		Inform the signal station immediately in the event any craft is seen adrift or any other Port installation is seen in danger. Arrange an Emergency Maintenance team.	
Manager (Marine Engg.)	ME Coordinator	Responsible for organizing tugs for combating the fire and rescue.	Sr. Dy. Manager (Marine Engg.)
		Hire additional craft as necessary.	
Floating Craft		Masters will shift their respective crafts at suitable places as directed by the Harbour Master and will secure them suitably with additional moorings.	
		Masters of respective crafts will be responsible for proper securing and safety.	
		Masters will keep the engines of their crafts ready to proceed at short notice as per the instructions of the Operation In-charge.	
		Extra fenders will be kept ready on board the Tug for use as required.	
		Engine room entrance doors, sky lights etc. of all the floating crafts to be kept shut.	
		The Floating Crafts shall be in constant touch with Signal Station.	
Workshops		Workshop should be manned continuously and should be ready with all the necessary equipment to attend during emergency.	
Material Management		During cyclonic season sufficient stock of stores like AC sheets, J.Hooks, screw hinges, gunny bags, tarpaulins, ropes and wires for Port Crafts, diesel oil, kerosene oil, hurricane lantern, kerosene lamps, torch lights with batteries and bulbs, electrical items etc. is kept.	
		All the materials which are likely to get damaged in rain are covered with tarpaulin.	
		Store Supdt. and store keeper along with other staff required to issue materials.	
Data Entry andStorage Cell		Start downloading isobaric internet pictures and reports 6 hourly after Signal No.1 and 3 hourly after signal 3.	
		Give copy to CIC and SIC and they in turn will apprise the Deputy Chairman and Chairman.	

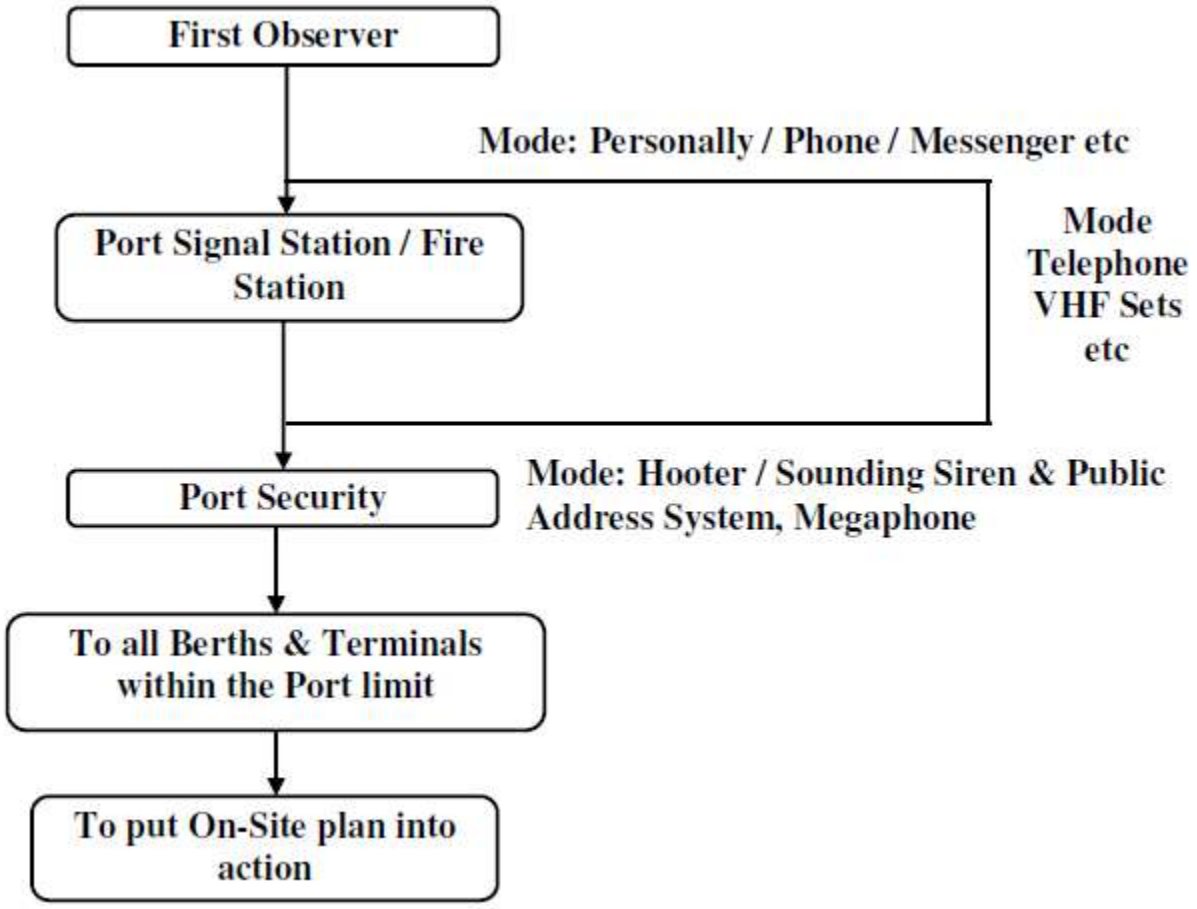
c) Step 6 – Situation Management

ACTIVATION OF RESPONSE PLAN

Prevention/Protection action implementation plan

Following is the typical Prevention/Protection action plan.

Figure No. 7: Action Implementation Plan



The person who observes the emergency first is called as the First Observer. The First Observer, noticing an unusual occurrence like a fire /gas release /collapse of structure etc., should immediately notify the Signal Room with available means of communication and also contact the concerned Officer of the area in person.

He would:

1. Raise alarm
2. Call fire station and signal station and pass on following information:

   - Introduce himself
   - State briefly the type of emergency
   - Give the location of the incident.

3. Proceed to a safe place. However, he would return to the location of the incident and place himself in a safe area cross-wind to the wind direction and standby to give assistance if he is part of the action group.

After receiving information from the First Observer, the Signal Station would notify all the key personnel of the Port and also direct the security personnel to activate Siren and will subsequently announce on the available means of Public Address System (say fire jeep which is fitted with PA system) as follows:

- Location of the emergency.
- Type of the emergency.
- Severity of emergency.

After hearing siren or the public announcement, all concerned personnel (identified in the plan) would move to their respective positions and will begin actions as documented in the plan.

SITE CONTROL PROCEDURE			
Site Control should be established for every site where access is to be controlled. This includes the EOC, sites of shoreline cleanup, waste storage, response vessel mooring areas or any site containing hazards or hazardous materials			
Task	**Action**		**Status**
1	Identify perimeter of the "Hot" (secure or prohibited)zone. This may be:		
	i	Oiled shoreline. (Note: This zone should contain all hazards and sensitive areas where access shouldbe restricted).	
	ii	Response vessels.	
	iii	Area around the incident.	
	iv	EOC	
2	Identify the "Hot" zone perimeter by sign-posting orestablishing a cordon.		
3	Identify the "Warm" (exclusion, controlled or support) zone. (Note: This is a non-contaminated/ non-hazardouszone). For e.g.:		
	i	Area behind beach including all areas used for support (shelter, canteen, car park).	
	ii	Jetty.	
	iii	Any water area established to exclude non-response vessels.	

SITE CONTROL PROCEDURE			
4	Identify the "Warm" zone perimeter by sign-posting or establishing a cordon.		
5	Establish any required "Hot" zone perimeter facilities. For example (i) and (ii) this may include:		
	i	Decontamination facility.	
	ii	Temporary waste storage.	
6	Establish "Warm" zone perimeter facilities. Generallythis is site security.		
7	Establish support facilities within Warm zone as required		

Note 1 Entry to a Hot Zone should be restricted to:

- Personnel involved in the on-site work.
- Personnel equipped with appropriate protective gear.
- Personnel who have undergone correct training and induction.

Note 2 The Warm Zone surrounds the Hot Zone and is the zone and is generally:

- The area from which personnel and equipment are deployed.
- The perimeter where site control is exercised i.e. the entry points to the Hot Zone.
- Restricted to those people who operate in the Hot Zone and those who support them.

Note 3 The Cold Zone is all public or otherwise unrestricted areas, i.e. those areas outside of the controlled site.

PLANNING MEETING SCHEDULE & PREPARATION OF THEINCIDENT ACTION PLAN (IAP)						
Phase/ Task		**Action**			**Responsibility**	**Check**
Meeting	1	Briefing on situation.			CIC or othersas nominated.	
		a	Current situation			
			i	Incident location		
			ii	Resources mobilized		
		b	Predicted situation:			
			i	Trajectory/Dispersion		
			ii	Resources at potentialrisk		
	2	State Aim of Response.				
	3	Develop and rank response objectives based on protectionpriorities.			CIC	
	4	Develop Strategies and Tactics.			CIC and allCoordinators	
	5	Identify necessity for obtaining any permit (e.g. dispersant use).			CIC	
	6	Prepare Draft Incident ActionPlan.			CIC	
	7	Determine need and location of Advanced Operations Centers or Staging Areas.			CIC and allCoordinators	
	8	Approve and Document IAP.			CIC	

Process to be repeated throughout the response as scenario, objectives, strategies or tactics change.

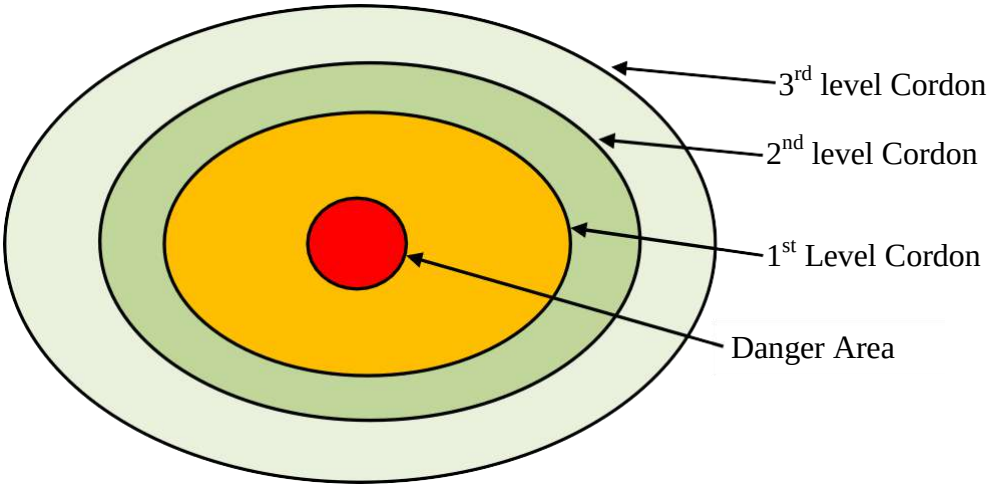
Mechanism for access control and isolation of the Danger area

1. All gates and landing jetties should be guarded,
2. Unauthorized person should not be allowed to the restricted area,
3. Authorized person will be entering the zone with all the necessary PPEs,
4. The area should be cordoned off during operation,
5. Proper signage board and warning should be displayed at the place of the operation,
6. Fire fighting facilities and other required resources should be available till the operation is terminated,
7. The restricted areas should be under surveillance at all times.

Mechanism for access control and isolation of the danger area

1. All gates of the jetties should be guarded,
2. Unauthorized person should not be allowed to the restricted area,
3. Authorized person will be entering the zone with all the necessary PPEs,
4. The area should be cordoned off during operation,
5. Proper signage board and warning should be displayed at the place of the operation,
6. Fire fighting facilities and other required resources should be available till the operation is terminated,
7. The restricted areas should be under surveillance at all times.

Figure No. 8: Isolation of Danger Area



Danger/Hazardous area

1st Level Cordon off

2nd Level Cordon off

- Site Control point
- Ambulance
- Casualty Clearing point

3rd Level Cordon off

- Traffic Control

Note: Positions will depend on the wind directions

Evacuation

1. On blast of Disaster warning siren, the workers will assemble at the respective assembly points to be transported to the refugee centres.
2. The assembly point earmarked at JNPA are as follows

Table No. 10: Assembly Points

Sr. No	Assembly Points
1.	CT Shift in-charge office
2.	In front of POC building
3.	POC Canteen building
4.	In front of Administration building
5.	NSDT
6.	TT Maintenance Section
7.	Office of Dy. Manager (LCB & NSDT)
8.	ICD Building
9.	E-7 Substation
Sr. No	**BPCL Jetty - Assembly Points**
1.	Jetty Control Room/Pump House building
2.	Near Liquid Cargo Jetty Entry Gate
3.	At the South west corner of Loading Berth
Sr. No	**APM Terminal – Assembly Points**
1.	Front House of GTI House
2.	Behind Eng. Workshop
3.	Central gate Complex
4.	Rail Head – ICD
5.	Wharf (Near Central Orange House)
6.	Yard 1U near South bridge starting
7.	ODC gate
8.	TDC
9.	Marshalling Yard
Sr. No	**DP World Terminal – Assembly Points**
1.	Wharf office (NSICT wharf office and NSIGTwharf office)
2.	Old Canteen
3.	E6 substation
4.	Operations center
5.	ICD Office
6.	Gate complex
Sr. No	**BMC Terminal – Assembly Points**
1.	Wharf office
2.	Workshop
3.	Admin Building
4.	Gate Complex
5.	Rail Goomti (near sub station1)
6.	Rail Office

3. The vehicle-carrying victim should be given the first priority in traffic movement.
4. While assessing the evacuation route, constant communication link should be maintained with the EoC as well as with the individual assembly point station from where the evacuation is to be undertaken.
5. As far as possible people should be advised not to use their vehicles since any breakdown of the same on the evacuation route would act as an obstacle to the vehicles being used for evacuation.

Evacuation Routes

In case of a general emergency one of the first duties of the CIC is to alert outside authorities and advise them about the actions that should be taken to protect the public, if any. The most significant risk affecting the local population is that of a toxic materials release.

The evacuation route could be by two ways

a. Land
b. Sea

Temporary Shelters

In the event of an impending disaster the affected population would have to be transported to intermediate temporary shelter. The temporary shelters identified for Port are schools and colleges located at Port Area and City.

Gathering & Rehabilitation centres

Table No. 11: Gathering and Rehabilitation centres

Centers	Location
Multipurpose Hall	JNPA Township
JNPA Hospital	
St. Mary's JNP School	
JNP Vidyalaya	
Officers and Staff club	

Administration department shall ensure adequate quantity of water supply at all the temporary evacuation centres.

CMO shall ensure that necessary medicine and medical assistance at the temporary evacuation centres is available.
Administration department shall take care of the requirement for food for the evacuees in the temporary evacuation centres. For supply of food packets, etc., they shall immediately contact the agencies (**Chapter 4**) of the area.
As a part of emergency relief Port Trust to consider 500 gm of rice per day per adult and 250 gm of rice per day per child. Relief of this scale should be catered to by consent of collector for a period of 3 days whereas a relief of 7 days could be obtained with the approval of Relief commissioner.
Extension of relief beyond 15 days could be sought from the State Government or Central Government.
Apart from the above, if required, he may contact the hotels (**Chapter 4**) for supply of food packets.

Transportation

Vehicle Pool

As soon as this Emergency Action comes into force, the vehicle pool is formed. The pool shall be controlled by Administration Department.

Apart from the Port vehicles, The Engineers shall hire vehicles with spark arrestors from other available sources for emergency work.

Engineers should ensure the availability of the drivers and vehicles and report compliance to the Deputy Chairman/Dy. Conservator. All vehicles whether it is of Port Trust or hired should be parked in the location as designated by Deputy Conservator from where it can be taken readily for immediate use.

Contact with Railways & State Road Transport Corporation

SIC should ensure for the smooth movement of workers/employees for which he may get in touch with the concerned officers and apprise them about the situation so that the movement of staff is not suffered.

Generator Sets

Wherever generator sets are required, CM (M&EE) officers shall be contacted, who shall immediately hire/procure or provide from whatever sources.

Decontamination

Additional issues in relation to decontamination of the public may arise at some hazardous materials incidents. Decontamination in this context refers to a range of procedures employed to remove hazardous materials from people and equipment. It includes terms such as:

- Clinical decontamination, meaning medical treatment by health professionals of patients affected by or contaminated with hazardous materials;
- Emergency decontamination, when time does not allow for the deployment of specialist resources and it is judged imperative that decontamination of people is carried out as soon as possible;
- Personnel decontamination meaning the decontamination of uninjured exposed persons;
- Mass decontamination is the procedure deployed where significant numbers of persons are deemed to require decontamination, beyond the normal decontamination capacity; and
- Equipment decontamination is the procedure used to clean the specialist equipment/protective suits which personnel use in dealing with hazardous material incidents.

The need for decontamination of individuals will be established by the On-Site Coordinator, in association with the other Controllers of Operations. The Medical Service Executive has responsibility for providing clinical decontamination and medical treatment to casualties affected by hazardous materials. The fire services have responsibility for providing other forms of physical decontamination of persons at the site. The Medical Service Executive will be responsible for decontamination where required to protect health service facilities, such as hospitals, from secondary contamination. Where emergency decontamination of the public is required, the fire service may use its fire-fighter decontamination facilities, or improvised equipment may be used prior to the arrival of dedicated equipment. Where persons have to undergo this practice it should be carried out under the guidance of medical personnel. It should be noted that emergency contamination carries risks for vulnerable groups, such as the elderly and the injured.

Medical Facilities

Depending on the nature of the emergency, it may be necessary to alert medical facilities within and outside the port.
Medical facilities likely to be used will need to be informed

- The nature and location of the emergency,
- The likelihood or number of casualties,
- Whether medical staff are required at the location of the emergency,
- Actual details of the casualties, including the names, as soon as these are known.

First Aid Centres

First Aid treatments provided at the port and the Port ambulance placed at every First Aid centres and hired vehicles, can be used for taking the person to the medical centre.

SEARCH AND RESCUE MECHANISM

Search and Rescue mechanism shall start as soon as the public warning signal has been issued and should be carried out as per the instructions of CIC/SIC.

Resource Management

Resources available with the port should be used effectively during the emergencies. The equipment should always be maintained, inspected and tested periodically.

LOGISTICS/SERVICE DELIVERY MECHANISM

The required/necessary equipment and assistance during various types of emergency can be requested from the Local Industry crisis groups, district crisis group MoU signed with Oil Industries and Tank farms association operating in port. Additional resources available for disaster relief with the various departments in the Raigarh District can be found from IDRN.

3.3 Post Crisis – The objective of this phase is to restore the normal situation and be prepared for any unknown crisis situation.

a) Step 7 – Recovery and Restoration

RESPONSIBILITY FOR TERMINATING THE RESPONSE

The decision to terminate a response is taken by the CIC in consultation with the JNPA Chairman or CMG.

CONDITIONS FOR TERMINATION

Marine Response Operations should be terminated when:

- Oil has been recovered to the extent practicable; or
- The surface oil slick has broken up; or
- The oil slick has gone out to sea and is beyond the range of response options, and is unlikely to return; or
- Oil has impacted shorelines and is no longer on the water.

In the last case marine response resources must remain on standby and equipment maintained at the ready until shoreline response operations have been completed.

Shoreline Response Operations should be terminated when:

- All accessible shorelines are clean to the extent practicable.
- Clean-up is having no further net beneficial effect or having a deleterious effect on the shoreline or associated plants or animals.

Shoreline clean-up operations may be terminated only upon the instruction of the **MPCB/Coastguard.**

Land Spill Response Operations should be terminated when:

- Chemical has been recovered to the extent possible,
- Area has been declared “Risk or Hazardous” free.
- Source of leakage is stopped and the condition of the area is safe for operation.

Land spill clean-up operations may be terminated only upon the instruction of the **MPCB and PNGRB.**

Fire Extinguishing operation should be terminated when:

- Fire has been completely extinguished,
- Area has been declared as "Risk or Hazardous or Smoke' free area.

Response action can also be terminated as per the Warning signals given by the agencies.

STAND-DOWN PROCEDURES

Return of Equipment

Upon completion of the response, the SIC (or delegate) will:

- Arrange recovery of all equipment, and unused materials.
- Ensure that all equipment is cleaned.
- Ensure that all equipment is returned to the owner.

Debrief

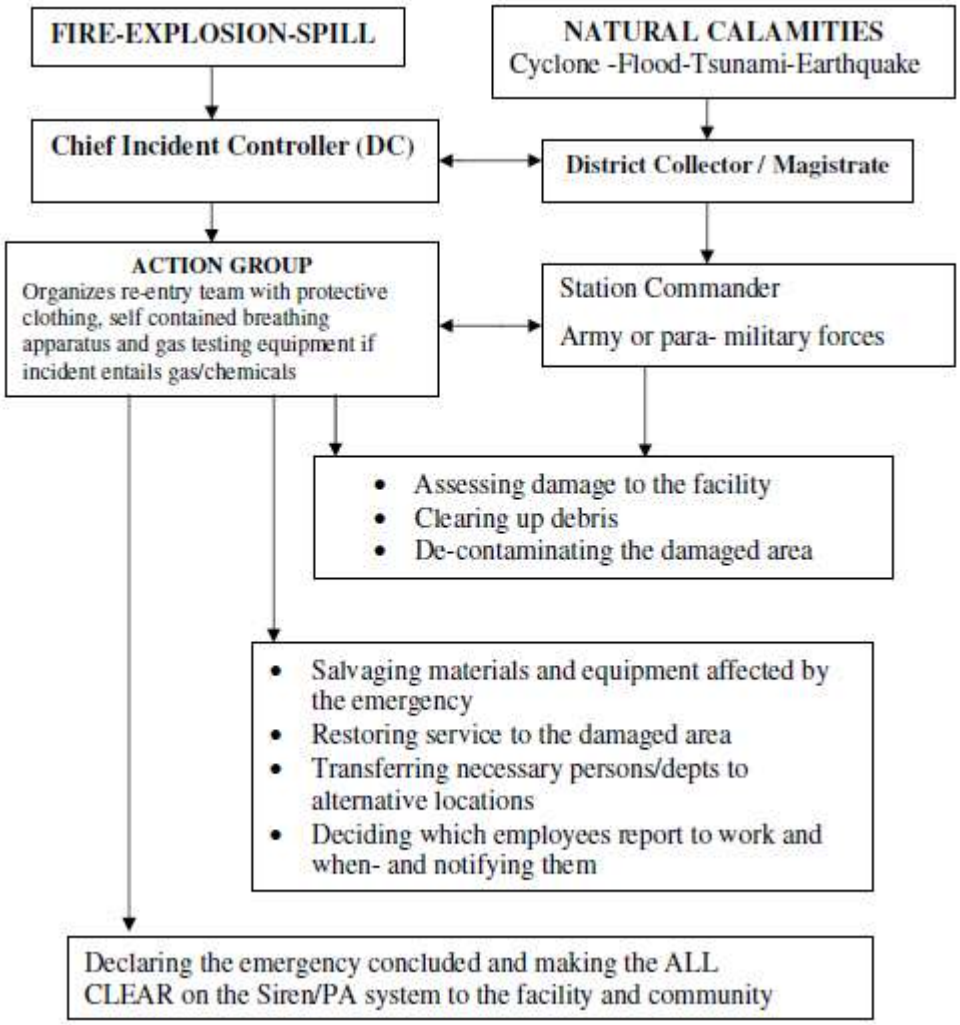
The SIC may hold a post-spill debriefing. Debriefing should address:

- Spill causes (if known) and future prevention methods.
- Speed of response activation.
- Effectiveness or suitability of strategies, tactics and equipment.
- Health and Safety issues (if any).
- Any other issues required to be communicated.
- Damage in terms of life, injury and loss of property should be assessed.

Incident Report

The Chairman JNPA and relevant authority may request the preparation of an Incident Report. This should follow the debrief outline or other format as specified.

Figure No. 9: DE-ACTIVATION OF THE PLAN-RECOVERY-RESTORATION



Note: *-For natural calamities etc at the District level-the District collector or District magistrate will make the necessary initiative through the paramilitary group. The Port Chairman or CIC may also request para military personnel to assist when the accidents have originated at the port premises.*

Specific procedures for recovering from an emergency and re-entering the facility can hardly be provided, since they will have to be determined on a case by case basis, depending on the type of accident and the severity of the damage suffered. However, provision would be made for the following:

1. Inspecting the damaged area
2. Declaring the emergency concluded and making the "all clear" known to the facility employees and the community
3. Deciding which employees would report to work and notifying them
4. Beginning an investigation into the causes of the emergency

5. Assessing the damage to the facility
6. Transferring necessary operations to alternative locations
7. Decontaminating the damaged area
8. Restoring services to the damaged area
9. Clearing up the debris
10. Salvaging material and equipment affected by the emergency
11. Restoring the parts of the facility affected by the emergency
12. Determining responsibilities and instituting possible insurance and damage claims.

Cost recovery

1. All records of costs must be collated for submission to the relevant insurer.
2. For expenses incurred assisting third parties, costs should be kept and submitted to relevant authority.

DAMAGE, LOSS AND NEED ASSESSMENT

Initial Damage Assessments

Following any major disaster, rapid assessment of damage is important for restoring the facilities, resuming Port operations and cost recovery. In certain cases e.g. terrorism and security related, thorough site or damage assessment is not possible immediately after an event. Access to, and assessment of Port facilities and its contents may be delayed for a period of time. The delays may be due to possible loss of structural integrity, necessary forensic investigation, or the existence or potential existence of toxic or hazardous materials.

Immediately following a disaster and as soon as it is safe to do so, the CISF or other designated team shall conduct a preliminary damage and environmental assessment by conducting a drive-through of all Port facilities. Damage will be noted in enough detail to allow it to be communicated to assess whether conditions are such that the Damage Assessment Team can be allowed entry and to prioritize recall of Key Personnel and begin developing action plans for recovery.

Secondary Damage Assessments/Temporary Repairs

Once the affected site is approved for entry, a Damage Assessment Team assembled by the Engineering Department will conduct a more thorough assessment of damage to facilities and utilities. This assessment will focus on those assets needed to facilitate a rapid recovery such as electric power, communications and transportation. The assessment should also identify any potential environmental issues that require immediate attention. Damage should be noted in enough detail to allow it to be communicated to begin developing action plans for recovery. At this time the actions will be initiated for recall of personnel and authorizing the purchase of materials and services needed to begin making repairs to

critical systems or addressing environmental hazards. Local utility companies need to be contacted at this time for anticipated schedules for restoration of critical utility services.

Assessment of Damage to Navigational Channel

The assessment of damage to the Navigation Channel is under the jurisdiction of the Indian Navy and Hydrographic department of Survey of India. Assessment of damage to the berthing area portion of the channel is under the jurisdiction of the terminal owner/operator. Assessment of damage to Aids to Navigation is under the jurisdiction of the Port. The Harbourmaster or other designated personnel will provide status report the condition of the channel to the Deputy Conservator.

Potential loss estimates analyzed include

- Physical damage to residential and commercial buildings, schools, critical facilities, and infrastructure.
- Economic loss, business interruptions, repair and reconstruction costs.
- Social impacts, including estimates of shelter requirements, displaced households, and population exposed to scenario floods, earthquakes and cyclone Short Term Reconstruction.
- The decision to rehabilitate or abandon port structures depends on the extent of damage, importance of the structure, and limits on its use. Aspects of an inspection may include:
- An underwater inspection by divers to check for possible demolition damage or deterioration of footings.
- An inspection of the piling at low water from a boat to check for decay, borer attack, or other damage. The stringers and deck are examined from below to determine the need for repair.
- Breakwaters, jetties, or seawalls are inspected for damage. If breached, such structures are repaired to avoid scour and further damage.
- Assessment of facilities by civil engineers and surveyors to ensure compliance with local building and architectural codes and to ensure that damaged or repaired buildings are safe for occupancy.

In the event of a terrorist act at the port, reconstruction planning should also take into account the interests of security representative, and the need to collect evidence.

REPAIR/RESTORATION PHASE

The repair and restoration phase of recovery must be a coordinated effort between all departments. Collectively, decisions will have to be made regarding the priority and order of repairs considering:

- Health and safety issues;
- Available cash flows;
- Spending authority;
- Bidding requirements;
- Contractor availability;
- Customer requirements;
- Lease/contract requirements; and
- Insurance claim management.

RECOVERY PLANNING

Short-term recovery planning

Short-term recovery planning runs parallel to short term response, and begins during and immediately after an incident

Medium-term recovery planning

In the medium-term recovery planning, port will engage in contracting and setting up for largescale reconstruction and reconstitution operations. This may include financial planning, contracting, and the formation of joint venture agreements to assist in long-term business continuity.

Initial reconstruction of damaged or destroyed facilities begins, as structural and civil engineers rehabilitate existing port structures. They use appropriate methods of lightering and port construction to handle cargo.

The reconstruction activities which may require an Environmental Impact Assessment are as follows:

a) Debris Removal
b) Emergency Protective Measures
c) Repair to Pre-Disaster Condition
d) Modification, Expansion, and Mitigation Projects
e) New Construction and Ground Disturbance

Sr. no. (d) Above has been included so as to undertake proactive mitigation steps as part of **"Build-Back-Better"** of the Sendai Framework.

Long-term recovery planning

In the event that a part of the entirety of a port becomes unusable or requires rebuilding, the long-term reconstruction considerations will be taken by MoS GoI taking into account the financial planning and resources that may be involved in the process. This may include budgetary support.

RE-OPENING OF BERTHS TO VESSELS

After the channel to the Port has been re-opened and the Port infrastructure is found to be in sound condition, the Port will be in a position to begin accepting request for berthing. This will require coordination between the Port, ship pilots, customers, tenants and private terminals.

Areas of consideration for prioritizing the calling vessels include:

- Available depth in the channel/draft of vessel;
- Condition of facilities to receive the vessel;
- Availability of labour to offload/load cargo;
- Is vessel carrying a critical feedstock for area manufacturing?
- Is vessel carrying commodities that can be used in recovery?

RAIL-WAGON DELIVERIES

After the Port has found the terminal rail infrastructure in sound condition, the Port will be in a position to begin accepting rail car deliveries. This will again require coordination between the Port, rail authority, customers, tenants and private terminals.

4. RELEVANT ANNEXURES (FLOWCHARTS, CONTACT DETAILS, EQUIPMENT LIST, DOCUMENTS, ACTs ETC.)

CONTACT DETAILS

TELEPHONE LISTS (OTHER EMERGENCY ORGANIZATIONS AND THE PORT EMERGENCY PHONE NUMBERS ARE AS FOLLOWS).

JAWAHARLAL NEHRU PORT AUTHORITY

Name of Authority	Contact Number		
	JNPA Office	RC Office, Mumbai	Residence / Mobile
Chairman	27244001 / 67814001 27242290 (Direct)	22832458	9819494001
Dy. Chairman	27244011 / 67814011 27242219 (Direct)	22045372	9819494002
Dy. Conservator	27244171 / 67814171 27242301 (Direct)	---	9819494004
Chief Manager (Traffic)	27244191 / 67814191 27242377 (Direct)	---	27472661 / 9819494011
Chief Manager (M & E Engineering)	27244181 / 67814181 27242302 (Direct)	---	27564505 / 9819494014
Chief Manager (Finance)	27244081 / 67814081 27242241 (Direct)	---	9769769100
Chief Manager (Administration) & Secretary	27244021 / 67814021 27242233 (Direct)	---	9819494003
Chief Manager (Port Planning & Development)	27244156 / 67814156 27242326 (Direct)	---	9819494005
Chief Medical Officer		---	
Harbour Master	24274173 / 67814173 27242334 (Direct)	---	27710513 / 9819494007
Sr. Dy. Chief Medical Officer	27472665	--	27472980 / 9819494015
Sr. Manager (P& IR)	27244023 / 67814023 27242639 (Direct)	---	27472314 / 9819494013
Manager (Finance) - I	27244087	---	25205241/ 9867385341
Dock Master - I	27245175 / 67815175	---	9323407839
Dock Master - II	27245175 / 67815175	---	9820243717
Manager (Main Container Berth)	27245003 / 67815003	---	9819999226
Manager (Liquid Cargo Berths & NSDT)	27244191 / 67814191 27242377 (Direct)	---	27719349 / 9819494010

Name of Authority	Contact Number		
	JNPA Office	RC Office, Mumbai	Residence / Mobile
Manager (Utility Services)	27244196 / 67814196 27242328 (Direct)	---	27743137 / 9819494015
Manager (ICD & NSDT)	27245005 / 67815005	---	9820160457
Manager (Port Equipment Maintenance)-I	27245001 / 67815001	---	9819494918
Manager (Materials)	27244198 / 67814198	---	9819999227
Manager (C&C) & MR	27244699 / 67814699	---	9819999227
Manager (Marine Engineering)	27245166 / 67815166	---	09830772584
Manager (Legal)	27244068 / 67814068 27242326 (Direct)	---	9819930549
Manager (Admn.)	27244025 / 67814025	---	9820618326
Manager (Estate) (Shri U.K Sharma)	27244066 / 67814066	---	9819999231
Manager (PP&D) – I (Shri SSP Patil)	27244160 / 67814160	---	9819999223
Manager (PP&D) – II (Shri N.A. Deshpande)	27244158 / 67814158	---	9920166500
Manager (PP&D) – III (Ms. Y. Bhat)	27244159 / 67814159	---	9819042609
Manager (MS)	27244138 / 67814138 27242317 (Direct)	---	9833673162
Dy. Manager (MS)	27244038 / 67814038		9820864080
Sr. Commandant (CISF)	27244216 / 67814216 27242294 (Direct)	---	9819999234
Dy. Commandant (CISF)	27244222 / 67814222	---	27472246 / 9819494017
Asstt. Commandant (CISF)	27244222 / 67814222	---	27472323
Asstt. Commandant (CISF)	27244682 / 67814682	---	9757090291
CISF Line Township	27472275 / 27472356	---	---
Asstt. Manager (Safety) & (MC & PC)	27245205 / 67815205	---	9833687769
Asstt. Manager (Fire & Safety)	27245173 / 67815173	---	9819711965
Master Unit Sub Station (MUSS), JNPA	27244691 / 67814691 27869496 (Direct)	---	---
Shift In-Charge (CT)	27245013 / 67815013	---	---
CISF Control Station	27244545 / 67814545 27242354 (Direct)	---	---
Central Gate Complex – CISF	27244682 / 67814682 27242354 (Direct)	---	---
North Gate Complex – CISF	27245195 / 67815195 24272362 (Direct)	---	---

Name of Authority	Contact Number		
	JNPA Office	RC Office, Mumbai	Residence / Mobile
South Gate Complex – CISF (ODC Gate)	27274681 / 67814681	---	---
Admn. Building Reception – CISF	27244218 / 67814218	---	---
JNP Hospital	27473568 / 67813568 24743560 / 67813560	---	---
Ambulance Room – Shift Office	27245200 / 67815200	---	---
Fire Station	27245000 / 67815000 27245100 / 67815100	---	---
Port Control Station	27245151 / 67815151 27245178 / 67815178 27242367 (Direct)	---	Marine VHF Channel No. 13
JNPA Township Main Gate	27243570 / 67813570	---	---
JNPA Pump House	27245179 / 67815179	---	---
NSFT			
Safety Officer	---	---	86507040848
OPS SDM	---	---	8657895582
BMCTPL			
Dy. Manager, Security	---	---	9920717038
Dy. Manager, Safety	---	---	7780222207
D.P. World			
HSE Head	---	---	7299977154
Shift Suptd.	---	---	9930405199
GTI			
Shift Manager	---	---	9653283831
HSSE Executive	---	---	9821816048
BPCL			
Safety Officer	---	---	9008713924
OPS Officer	---	---	9874806175

GOVERNMENT SERVICES

Name of Authority & Address	Telephone Number
Dy. Director, Inspectorate Dock Safety,Operation Service Centre, 3rd Floor, Opp. GPO, P.D. Mello Road, Mumbai – 400 038.	2269 2180 Direct 2262 4321 ext.3511/ 3558 Fax No. - 2261 3391
Asstt. Director, Inspectorate Dock Safety,	27245099
POC Ground Floor, Canteen Building,JNPA, Navi Mumbai - 400707	9028807870
Director General, Factory Advice Service & Labour Institute, Central Labour Institute,	2409 2203 Fax No. - 407 1986

Name of Authority & Address	Telephone Number
N.S.Mankikar Marg, Sion, Mumbai – 400 022.	
Member Secretary, Maharashtra Pollution Control Board, Mumbai	22659107, 22614348/92345, Fax No. - 22612320
Regional Officer, MPCB, CBD, Navi Mumbai.	27572739, 27572940
Chief Controller of Explosives A Block CGO Complex Fifth floor,Seminary Hills Nagpur – 440006	(0712)2510248
Joint Chief Controller of Explosives	27575946, 27575946,
A-1 and A-2 Wing, 5th Floor, C.G.O. Complex, CBD	27564941
Belapur, Navi Mumbai – 400614	
Directorate of Industrial Safety and Health	2494 2230
District Collector, Raigad, Alibag.	95 – 0245 – 222001
Dy. District Collector Raigad, Alibag	95 – 0245 – 222081
Home Guard, Raigad, Alibag	95 – 0245 – 222012
Municipal Commissioner, Navi Mumbai CBD, Belapur, Navi Mumbai	27571095
MSEB, Uran	27222235 ext. 400
Municipal Commissioner, Thane	25336523
District Collector, Thane	25344041
Tahsildar, Uran, Raigad	27222352
Health & Medical	
Civil Surgeon, Raigad, Alibag	95 – 0245 – 222157
Chief Medical Office, Thane Municipal Corporation	25347784
Health Officer, Raigad, Alibag	95 – 0245 – 222077
Asst. Medical Officer, Navi Mumbai Municipal Corporation	27573781, 27573028
Civil Surgeon, Thane	25341541
Health Officer, Thane	25369682
Doctor on Duty	
L.T.M.G. Hospital, Sion, Mumbai	24076381 / 24072737
J.J. Hospital, Byculla, Mumbai	23760943 / 23735555
KEM Hospital, Parel, Mumbai	24136051
G.T. Hospital, Mumbai	22621464
Indira Gandhi General Hospital, Uran (Municipal)	27222233
Civil Hospital, Thane	25342582
Sir M. Yusuf Seamen Welfare Foundation, Nhava, Tal-Uran, Raigad	24938740
MGM Hospital, CBD, Belapur, Navi Mumbai	27570219
Nanavati Hospital, Mumbai	26182255
Transport	
Depot Manager, S.T. Depot, Uran Naka, Uran	27222333

Name of Authority & Address	Telephone Number
S.T. Controller, S.T. Depot, Thane	25331892 / 25331893
Depot Manager, S.T. Depot, Panvel	27452701
Controller, Navi Mumbai Municipal Transportation, CBD, Belapur	27655561 / 27801895
Civil Defense	
Director of Civil Defense, Mumbai	22843667
Addl. Controller of Civil Defense, Mumbai	22611928
Dy. Controller of Civil Defence, Uran.	27222343
Home Guard, Alibag	(0245) – 222012
Fire Services	
Nad, Karanja, Uran	27222520
Sheva	27242265
MSEB, Bodakvira, Uran	27222235
ONGC, Uran	2222916035, 27234444-46
ONGC, Nhava	27211100
Fire & Emergency Response Centre, Rabale	27680207, 27680208
Vashi, Navi Mumbai	27660101
CBD, Belapur, Navi Mumbai	27572111
Nerul	27707101
Kalamboli	27420138
Panvel	27452337
Wagle Estate, Thane	25323547, 25323577
Thane City	25331399, 25366401, 25401589
ONGC, Panvel	27486030/6660, 27453673
Mumbai	23076111, 23086181/101
Mumbra	25352424
Mumbai Port Trust	22614321 (Extn. 2260/2261)
Police	
District Superintendent of Police, Raigad, Alibag	(0245) – 222093
Police Commissioner, Thane	25344499
Police Commissioner, Navi MumbaiCBD, Belapur, Navi Mumbai	27684860
Asst. Commissioner (Traffic Police) Navi MumbaiCBD, Belapur, Navi Mumbai	27684860, 27576282
Police Control Room, Mumbai	2620111, 22621855/ 100
Police Control Room, Raigad	(0245) – 222100
Police Station, Sheva, Uran	2724 2264
Water Supply	
Water Supply Station, JNPA	27242243
Supdt. Engineer, MWSSB, Thane	25427855
Executive Engineer, MWSSB, Panvel	27453632

EQUIPMENT LIST

1. EMERGENCY CONTROL CENTRE

1.1 PORT CONTROL ROOM SHALL BE EMERGENCY CONTROL CENTRE

1.2 EQUIPMENTS: It is equipped with the following:

- Port water line to be backed with alternate supply.
- Automatic display name, address, telephone numbers of any incoming call once the Emergency Control Centre number is dialed, the same thing should be registered on the computer
- Flip up of maps & which:
  - ☞ shows First Aid locations
  - ☞ shows terminals storing toxic chemicals and terminals storing flammable chemicals
  - ☞ gives transportation map depicting transportation route for hazardous cargo by road and rail tankers
  - ☞ Assembly points, fire hydrant

ALTERNATE CONTROL ROOMS: JNPA have chosen to have a secondary control room which is Chamber of Chief Manager (Admn.) & Secy. located in the Administration building

1.3 LOGBOOKS: Control room will maintain the log books

1.4 EMERGENCY CONTROL ROOM EQUIPMENTS

Sr.	Equipment	Nos.
1.	Emergency lights and torches	6
2.	Radio	1
3.	Computer	1
4.	Printer	1
5.	Telephone-one for in; other for outgoing calls	2
6.	White board and colored marker pens	1
7.	Flip charts	1
8.	Portable PA Sets	2
9.	Walkie talkies	6
10.	Binoculars	1
11.	Copy of EAP	2
12.	Table-seating	1
13.	Tables-for equipment	4
14.	Chairs	10

2. EMERGENCY EQUIPMENTS & FACILITIES

2.1 RESOURCES FOR COMBATING OIL SPILL

JN Port

Sr.	Items	Quantity	Weight / Dimensions
1	Oil spill Dispersant kept on board tugs and in stock	5300 liters	2800 liters on board tugs 2500 liters in stock
2	Oil absorbent pads	30 nos. 100 nos.	40 x 50 cms each 15'' x 19'' each
3	Oil absorbent pillows	05 nos. 100 nos	30 x 50 cms each 18'' x 18'' each
4	Oil absorbent socks	15 nos. 105 nos	08 x 120 cms each 3'' x 8'' each
5	Saw dust	2500 kgs.	50 bags of 50 kg. each

Bharat Petroleum Corporation Ltd. (Operator of Liquid Cargo Handling Berths under BOT)

Sr.	Items	Quantity / Capacity
1.	Oil Boom	240 meters
2.	Oil Dispersant Spray system	02 nos.
3.	Oil sorbent pillows	200 nos.

Nhava Sheva International Container Terminal (DP World)

Sr.	Items	Quantity	Weight / Dimensions
1.	Saw dust	20 bags	10 kg each bag
2.	Oil absorbent pads	20 packets x 10 each	50 cm x 50 cm
3.	Oil boom	12 pieces	3” dia. x 8 feet
4.	Long handle deck brushes, heavy duty	4 pieces	40 cm brush length
5.	Long handle cane booms, suitable for liquid	4 pieces	
6.	Hand booms suitable for liquids	2 pieces	
7.	Long handle shovel (Non spark)	4 pieces	
8.	Hand held Plastic scoops	4 pieces	
9.	Plastic bags (Heavy Duty)	250 nos.	
10.	Empty oil drums with lids	4 nos.	200 lilts
11.	Oil spill chemical dispersant	5 drums	20 lilts

Sr.	Items	Quantity	Weight / Dimensions
12.	Oil resistant gloves	4 pairs	
13.	Fire extinguishers 9 lit foam type	2 nos.	
14.	Plastic buckets, 10 lilts	4 nos.	
15.	Plastic funnels	4 nos.	
16.	Rags, General Use	20 kg.	
17.	Sawdust Bags	296 bags	10 Kg
18.	Sand Bags	60 bags	50 Kg
19.	Scoop	12 pieces	
20.	Eye Protective Goggles	10 pieces	
21.	Rubber Hand Gloves	12 pieces	
22.	Oil Spill Containment Boom	12 pieces	
23.	Long Handle Coir Broom	12 pieces	
24.	Absorbent Pads	100 pieces	18" x 16"
25.	Dust Masks	50 pieces	
26.	Shovel	10 pieces	
27.	Cotton Bags	02 nos.	
28.	empty drums (200 Liter)	03 nos.	

APM Terminals

Sr.	Description	Quantity	Weight / Dimensions
1.	Oil Absorbent Socks	6 boxes (6 pieces per box)	7.6 cm x 244cm
2.	Oil Absorbent Pillow	2 boxes (16 pieces per box)	18" x 18"
3.	Oil Absorbent Pads	2 boxes (32 pieces per box)	9" x 9"
4.	Booms	9 bales (4 per bale)	(8" x 10")
5.	Perforated Rolls	6 bales (1 per bale)	46 cm x 38 cm
6.	Sheets	2 bales (100 Sheets per bale)	38 cm x 48cm
7.	Sweep – sorbent roll, bonded to a P.P. Rope	2 bales (1 per bale)	30.5m x 48 cm

2.2 PORT FIRE FIGHTING RESOURCES

Fire Fighting Equipment	Nos.	Capacity & Specifications	Location
Fire Water Tender	2	Water Tank : 6000 liter.	Fire station
Fire Foam Tender	1	Water Tank : 3000 liter., Foam Tank : 800 liter. CO2 Fire Extinguisher 22.5 kg. X 2 DCP Fire Extinguisher 70 kg. X 2	Fire station
Multipurpose Fire Tender	1	Water Tank : 3000 liter., Foam Tank : 800 liter. CO2 Fire Extinguisher 22.5 kg. X 4 DCP Ship 500 kg.	Fire station
HAZMAT cum Emergency Response Tender	1	Equipped to deal with hazmat emergency and rescue operation	Fire Station
Water pumps Main PumpsDiesel Pump	4 1	Electrical operated (273 m3/hr) Diesel engine (273 m3/hr)	Pump House
Water reservoir	1	1638 m3	Fire station
Fire Hydrants	20		Utility Area (Auto Garage, Work Shop, Main Stores)
Breathing Apparatus Sets	23	Compressed Air-used for 45min	Fire station
PVC Chemical handling suits	10		Fire station
Fire Proximity Suits	4	Aluminized	Fire station
Fire Entry Suit	2		Fire station
Hand Set (Walkie Talkie)	2		Fire Station

2.3 PORTABLE FIRE EXTINGUISHERS

Types of Extinguishers	Numbers
Dry Chemical Powder (DCP)– 5kg	47
Dry Chemical Powder (DCP)–10kg	50
Dry Chemical Powder (DCP)– 22.5kg	9
ABC Powder Type – 2kg	32
ABC Powder Type – 5kg	38
CO2 Type – 3 kg	241
CO2 Type – 4.5 kg	161
CO2 Type – 6.5 kg	75
Water CO2 Type – 9 liters	259
CO2 Type – 2 kg	02

2.4 EQUIPMENT AND MATERIALS INVENTORY

The following equipment and materials will be available with Site Incident Controller: (Terminal Shift In Charge offices & Port Control room)

Sr. No.	Equipment / Material
1.	Copy of EMERGENCY ACTION PLAN
2.	List of personnel
3.	Residence telephone numbers of key Port personnel
4.	Basic facility data and drawings
5.	VHF radio with battery
6.	Laminated "SITE INCIDENT COORDINATOR" sign to be done
7.	Current telephone directories
8.	Message book (with duplicate copy pages)
9.	Clipboards (3)
10.	Tables (3)
11.	Steno tables (2)
12.	Pens (12)
13.	Pencils (12)
14.	Felt tip indelible marker Black (2), Red (2)
15.	Trash bags - large (1 box)
16.	Duct tape
17.	First Aid Kit
18.	AM/FM radio & "AA-cell" batteries (3)
19.	Spare batteries "AA-cell" batteries (9) "D-cell" batteries (8)

5. LIST OF TABLES

6. LIST OF FIGURES

7. ABBREVIATIONS

AERB	Atomic Energy Regulatory Board
BARC	Bhabha Atomic Research Centre
BPCL	Bharat Petroleum Corporation Limited
CBRN	Chemical, Biological, Radiological and Nuclear
CCA	Central Coordinating Authority
CEC	Chief Emergency Controller
CMO	Chief Medical Officer
CIC	Chief Incident Controller
CISF	Central Industry Security Force
CMG	Crisis Management Group
CMP	Crisis Management Plan
CMV	Central Motor Vehicle
CWC	Cyclone Warning Centers
CPCB	Central Pollution Control Board
DPR	Detailed Project Report
DDMA	District Disaster Management Authority
DISH	Director of Industrial Safety and Health
DMP	Disaster Management Plan
EAP	Emergency Action Plan
EOC	Emergency Operation Centre
EWS	Early Warning Systems
EPPR	Emergency Prevention, Preparedness and Response
F&SO	Fire and Safety Officer
GPS	Global Positioning System
GTI-APM	Gateway Terminal India – A.P. Moller
INCOIS	Indian National Centre for Ocean Information Services
IMD	India Meteorological Department
IMO	International Maritime Organization
IRT	Incident Response Team
IWT	Inland Water Transport
IOCL	Indian Oil Corporation Limited
ISRO	Indian Space Research Organization
LPG	Liquefied Petroleum Gas
MHA	Ministry of Home Affairs
MARG	Mutual Aid Response Group
MbPT	Mumbai Port Trust
MCZMA	Maharashtra Coastal Zone Management Authority
MMD	Mercantile Marine Department
MoEFCC	Ministry of Environment & Forest and Climate Change
MPCB	Maharashtra Pollution Control Board
MSDS	Materials Safety Data Sheet
MSEB	Maharashtra State Electricity Board

MTPA	Million ton per annum
MSIHC	Manufacture, Storage and Import of Hazardous Chemical Rules
MWSSB	Maharashtra Water Supply and Sewerage Board
NW	National Waterways
NEC	National Executive Committee
NGO's.	Non-Governmental Organizations
NCMC	National Crisis Management Committee
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force
NSFT	Nhava Sheva Freeport Terminal
NSICT	Nhava Sheva International Container Terminal
NSIGT	Nhava Sheva (India) Gateway Terminal
OH&S	Occupational Health and Safety
OSRO	Oil Spill Response Organization
PAS	Public Address System
PESO	Petroleum and Explosives Safety Organization
PNGRB	Petroleum and Natural Gas Regulatory Board
PO	Procurement Officer
POC	Port Operation Centre
PPD	Port Planning and Development
PUB	Port User Building
SAR	Search and Rescue
SEC	State Executive Committee
SIC	Site Incident Controller
SMPV	Static and Mobile Pressure Ship
SPCB	State Pollution Control Boards
SO	Safety Officer
SDMA	State Disaster Management Authority
VHF	Very High Frequency