

NATURAL DISASTERS

Protecting and Assisting People in Emergencies

OPERATING PROCEDURES AND STANDARDS

PUBLIC WORKS DEPARTMENT

Disaster Mitigation & Management Centre
GOVERNMENT OF UTTARANCHAL, DEHRADUN-248001

INTRODUCTION

The text on "Operating Procedures and Standards for Monitoring" includes:

- Procedures for warning
- Operating procedures for evacuation
- Comprehensive Operating Procedures for the Departments:
 - relief and recovery
 - the standards of services
 - checklists for monitoring
- Monitoring relief and rehabilitation
 - standard arrangements for transit camps
 - relief camps
 - cattle camps
 - feeding centres
 - standards of service

1.0 OPERATING PROCEDURES FOR WARNING

Definition:

Alert! Warning indicates the onset of a disaster for which a warning system is essential. This system may range from alarms (e.g., for fires), sirens (e.g., for industrial accidents) to public announcements through radio, television etc. (e.g., for floods) and other traditional modes of communication (e.g. beating of drums, ringing of bells, hoisting of flags).

(In most disaster situations, the experience has shown that loss of life and property could be significantly reduced because of preparedness measures and appropriate warning systems. The importance of warning systems therefore hardly needs any emphasis. However, not in all cases, that the opportunity for warning exists. Indiscriminate warning may result if non-responsible officer is designated to issue the warnings).

1.1 Agencies Authorized to Issue Warning

The district administration is the prime agency responsible for issuing the disaster arning.

Additionally the technical agencies authorized to issue warning are mentioned below.

Disaster	Agencies
Earthquake	IMD, NGRI, BARC, GSI
Floods	IMD, Irrigation Department, CWC
Epidemics	Public Health Departments
Road Accidents	Police, RTO
Industrial and chemical Accidents	Police, RTO Department of Industries
Fires	Fire brigdage, Police, Forest Department

1.2 Important Elements of Warning

The following aspects may be considered for dissemination of warnmg:

- All warning systems and technologies are maintained in working condition and checked

regularly.

- Communities in disaster prone areas are made aware of the warning systems.
- Alternate warning systems must be kept in readiness in case of technical failure (e.g. power failure).
- Only the designated agencies officers will issue the warning.
- All available warning systems should be used.

(each warning system has a limited reach and multiple warning systems will help in reinforcement)

- The warning should to the extent possible be clear about the severity, the time frame, area that may be affected.
- Warning statements should be conveyed in a simple, direct and non-technical language and incorporate day-to-day usage patterns.
- The do's and don'ts should be clearly communicated to the community to ensure appropriate responses.
- Warning statements should not evoke curiosity or panic behavior. This should be in a professional language devoid of emotions.
- Rumor control mechanisms should be activated
- All relevant agencies and organisations should be alerted
- Wherever possible, assistance of community leaders and organised groups should be sought in explaining the threat.
- Once a warning is issued, it should be followed-up by subsequent warning in order to keep the people informed of the latest situations
- In the event of the disaster threat tiding away, an all clear signal must be given

2.0 OPERATING PROCEDURES FOR EVACUATION

A disaster management plan can provide indicative instructions for response since disasters by their very nature will be different and will often involve a combination of aspects, which may not have been considered during the planning process.

Situation:

- **Immediate threat to community**
 - When the community is exposed to danger within three hours; and
 - When evacuation within one kilometer distance is to be effected;
- **Action to be taken**
 - Any government official may order evacuation on the site
 - in consultation with technical personnel (such as in case of toxic gas container leak)
or
 - in consultation with the local non-official (such as sarpanch)
 - for appropriate security and law and order evacuation should be undertaken with assistance from community leaders.

All such evacuations should be reported to DM or SP within six hours.

All other evacuations, that is, threat after three hours or evacuation beyond one kilometer, can be ordered only by the DM or the competent authority specified in District Disaster Management Action Plan (DDMAP), Public Health Officer, Irrigation Officer, Police, Fire Brigade, and Industrial Security Officer.

(The Emergency Operation Group (EOG)/Disaster Mitigation & management Centre (DMMC) will have to ensure that each DDMAP specifically lists the designated officers for authorization of evacuation against each type of disasters in the final document.)

2.1 Factors to be considered for Evacuation

Planning Assumptions

- The amount of time needed for evacuation will depend on the disaster
- If the event can be monitored, like development of Iowa pressure area, the GoUA could have a day or two to get ready
- In other disasters, it is mostly emergency evacuation
- Roads, to be used for evacuation, should be within one hour's walk, 3 miles (5 km) of dwellings
- The evacuation routes should be away from the landslide or flood-prone areas.
- Evacuation routes should not include roads likely to be damaged by landslide, but may include pathways.
- Ensure proper evacuation by seeking community participation along the following lines:
 - Evacuation should be undertaken with assistance from community leaders and community based organisations (CBOs) for appropriate security and law and order
 - It is always preferable to encourage the entire family to evacuate together as a unit
 - In case of inadequate transport or limited time, encourage community for emergency evacuation in the following order:
 - seriously injured and sick
 - children, women and handicapped
 - old
 - disabled persons

(An evacuation plan On a priority basis helps avoid stampede and confusion)

2.2 Evacuation of Affected Persons

In the case of affected persons, if necessary

- evacuation must be carried out within the shortest possible time.
- the affected persons must be transferred to transit camps.
- within the shortest possible time (3 hours of the disaster), affected people must be provided
 - water
 - medicines
 - first-aid
 - cooked food

(This can continue for 48 hours after the disaster)

- **Emergency transport for the seriously injured by**
 - road transport/traditional means of transport
 - helicopters
- A senior medical officer should accompany the rescue team along with required medical kit and ensure priority for shifting of those seriously injured or requiring immediate medical attention
- Water supplied must be in accordance with acceptable standards of potable water. It is the responsibility of Medical Officer to check the water quality.
- The procedures for tagging should be followed

(Training is a process of prioritizing transfer of injured based on first hand assessment of chance of survival by the medical officer on the disaster site. The identification of patients is done by attaching a tag to each patient, usually color coded to indicate a given degree of injury and the priority for evacuation)

- For food supplies, the standards should be followed

3.0 OPERATING PROCEDURES AND STANDARDS FOR DEPARTMENTS

3.1 Planning Assumptions

The standards of services have been adopted from international norms and have been at times modified to suit local conditions. Although it is difficult to maintain efficient service standards in a disaster, which presents a fluid and confused situation, all efforts should be made to reach as close to these norms as possible. Some of the standards make a lasting impact on the communities whereas others have an immediate impact in the field situation, e.g. lack of adequate space per person in relief camps can lead to mental health issues and the absence of adequate sanitation facilities can lead to epidemics.

The Operating Procedures developed for each department refer to standards of services to be delivered and the appropriate checklists for field monitoring. Hence, the standards and checklists go hand in hand with Operating Procedures for every department.

These departments include Power Corporation, Police, Public Health, Irrigation, Agriculture, Animal Husbandry, Jal Sansthan, PWD, P&T, Railways and Airport Authority.

4.0 OPERATING PROCEDURES FOR POWER CORPORATION

4.1 Preamble

These operating procedures aim at organization of assets and resources of SEB. They are formulated for assisting EOG/DMMC at the state level, Divisional Commissioner at the divisional level and the District Magistrate/Disaster Manager at the district level for the services identified for this organization.

4.2 Planning Assumptions

- There is no substitute for maintaining standards of services and regular maintenance during the normal times. This affects the response of the department to any disaster situation.

The department is required to study Operating Procedures for mobilizing community participation during various stages of disaster management and adopt appropriate measures to ensure that community participates substantially.

For effective preparedness, the department must have a disaster response plan or disaster response procedures clearly defined in order to avoid confusion; improve efficiency in cost and time.

'Orientation' and training for disaster response plan and procedures accompanied by simulated exercises will keep the department prepared for such eventualities. Special skills required during emergency operations need to be imparted to the officials and the staff.

- To the extent possible; preventive measures as recommended in the preparedness and mitigation document of DDMAP should be undertaken to improve departmental capacity to respond to a disaster.

4.3 Normal Time Activity

Maintain a list of disaster prone areas in the district.

4.4 Action Plan Objective in a Disaster Situation

- Restoration of roads to their normal conditions
- Repair/reconstruction of public utilities and buildings

4.5 Activities on Receipt of Warning or Invocation of District DMAP (DMAP)

Within the affected district/tehsil, leave sanctioned to the department personnel as requisitioned by the DM will stand cancelled and the personnel will report back on duty.

Out-of-station officers and staff will be recalled.

All personnel working within the district come under the direction and control of the DM.

Establish radio communications with *EOG/DMMC*, Divisional Commissioner, District Emergency Operation Group (DEOG) and your departmental offices within the division.

All district level officials of the department would be asked to report to the DM.

Appoint one officer as "Nodal Officer - PWD" at the state level.

Appoint one officer as "Officer-in-Charge - PWD" at the district level.

The DM to provide "Officer-in-Charge - PWD" or the field staff as the need be, with all needed authorizations with respect to:

1. Recruiting casual labourers
 2. Procuring locally needed emergency tools and equipment and materials.
 3. Expending funds for emergency needs.
- The "Officer-in-Charge - PWD" will ensure that all field staff and other officers submit the necessary reports and statement of expenditure in a format as required by DM.
 - The "Officer-in-Charge - PWD" will be responsible for mobilizing staff and volunteers to clear the roads in his section should a disaster strike.
 - The "Nodal Officer - PWD" should be familiar with pre-disaster precautions and post-disaster procedures for road clearing and for defining safe evacuation routes where necessary.
 - All officers (technical officers) should be notified and should meet with staff to review emergency procedures.
 - Review and update precautionary measures and procedures and review with staff the precautions that have been taken to protect equipment and the post-disaster procedures to be followed.
 - Vehicles should be inspected, fuel tanks filled and batteries and electrical wiring covered as necessary.

- Extra transport vehicles should be dispatched from HQ and stationed at safe strategic spots along routes likely to be affected.
- Heavy equipment, such as front-end loaders, should be moved to areas likely to be damaged and secured in a safe place.
- Inspect all roads, road bridges by a bridge engineer, including underwater inspection of foundations and piers. A full check should be made on all concrete and steelwork.
- Inspect all government buildings and structures (including hospital buildings) by a senior engineer and identify structures, which are endangered by the impending disaster.
- Emergency tool kits should be assembled for each division, and should include:
 1. Crosscut saws
 2. AXes
 3. Power chain saw with extra fuel oil
 4. Sharpening files
 5. Chains and tightening wrenches
 6. Pulley block with chain and rope
- The designation of routes strategic to evacuation and relief should be identified and marked, in close coordination with Police and DEOG.
- Establish a priority listing of which roads will be opened first. Among the most important are the roads to hospitals and main trunk routes.
- Give priority attention to urgent repair works that need to be undertaken in disaster affected areas.
- Work under construction should be secured with ropes, sandbags and covered with tarpaulins if necessary.
- Emergency inspection by mechanical engineer of all plant and equipment in the district

workshops.

- If people are evacuating an area, the evacuation routes should be checked and people assisted.
- Identify locations for setting up transit and relief camps, feeding centres and quantity of construction materials and inform EOG/ *DMMC/DEOG* accordingly.

4.6 Relief and Rehabilitation

- All work teams should be issued two-way communication link. Provide, with a work team carrying emergency tool kits depending on the nature of the disaster, for essential equipment such as:
 1. towing vehicles.
 2. earth moving equipment.
 3. cranes etc.
- Each unit should mobilize a farm tractor with chain, cables and a buffer stock of fuel.
- Adequate road signs should be installed to guide and assist the drivers.
- Begin clearing roads. Assemble casual labourers to work with experienced staff and divide into work gangs.
- Coordinate with Zilla Parishad.
- Mobilise community assistance for road clearing by contacting community organizations.
- Undertake through maintenance engineer's staff cleaning of ditches, grass cutting, the burning or removal of debris and the cutting of dangerous trees along the roadside in the affected area.
- Undertake repair by maintenance engineer's staff of all paved and unpaved road surfaces including edge metalling, pothole patching and any failure of surface foundations in the

affected areas and keep monitoring their conditions.

- Undertake construction of temporary roads to serve as access to temporary transit and relief camps and medical facilities for disaster victims.
- As per the decisions of the DEOG, undertake construction of temporary structures required for organising relief work and construction of relief camps, feeding centres medical facilities, cattle camps, etc.
- An up-to-date report of all damage and repairs should be kept in the record and communicate the same to the DEOG.
- If possible, a review of the extent of damage (by helicopter) should be arranged for the field Officer-in-Charge, in order to most efficiently dispatch road-clearing crews and determine the equipment needed.

The amount spent on disaster management in pursuance of these relief activities, after receipt of warning or disaster strike, will be submitted to the Commissioner Disaster Management. The Commissioner Disaster Management will book this expenditure and reimburse the amount to the PWD Department.

4.7 Standards for Relief Camps

I Tent Camps

- The layout of the site should meet the following specifications:
 1. 3-4 hectares of land/1000 persons;
 2. roads of 10 meters width;
 3. minimum distance between edge of roads and tents of 2 meters;
 4. minimum distance between tents of 8 meters;
 5. minimum floor area/tent of 3 square meters per person.

- Water distribution in campsites should consist of:
 1. minimum capacity of tanks of 200 liters;
 2. minimum capacity/capita of 15 liters/day
 3. maximum distance of tanks from farthest tent of 100 m.
- Solid waste disposal containers in tent camps should be:
 1. waterproof.
 2. insect-proof.
 3. rodent-proof.
 4. the waste should be covered tightly with a plastic or metallic lid.
 5. the final disposal should be by incineration or by burial.
- The capacities of solid waste units should be 1 litre/4-8 tents; or 50-100 litres/25/50 persons.
- Excreta and liquid waste should be disposed in . bore-holed or deep trench latrines in tent camps. Specifications for these are:
 1. 30-50 m from tents;
 2. 1 seat provided/10 persons;
 3. Modified soakage pits should be used for wastewater by replacing layers of earth and small pebbles with layers of straw, grass or, small twigs. The straw needs to be removed on a daily basis and burned.
 4. Washing should take place with an ablution bench that is:
 - a. 3 m in length;
 - b. double-sided;
 - c. 2/100 persons.

II. Buildings

Buildings used to accommodate victims during relief should provide the following:

1. minimum floor area of 3.5 sq m/person;
2. minimum air space of 10 sq m/person;
3. minimum air circulation of 30 cubic m/person/hour;
4. There should be separate washing blocks for men and women;
5. Washing facilities to be provided are:
 - 1 hand basin/10 persons; or
 - 1 wash bench of 4-5 m/100 persons and 1 tap/50 persons in temperate climates;
 - 1 tap/30 persons in hot climates.
6. Toilet accommodations in buildings housing displaced persons should meet these requirements:
 - 1 seat/25 women;
 - 1 seat plus 1 urinal/35 men;
 - maximum distance from building of 50 m.
7. Refuse containers are to be plastic or metallic and have closed lids. To be provided are:
 - 1 container of 50-100 litres capacity/25-50 persons.

Checklist for PWD

(to be filled in by Officer-in-Charge and submitted to DCR and department head)

Action Taken	Y/N	Details/ Remarks
Radio communication established with -EOG - Commissioner Disaster Management -DMMC - Divisional Commissioner -DEOG - Departmental offices within the division		
An officer appointed as "Officer-in-Charge- PWD"		
Extra transport vehicles dispatched from HQ		
Work under construction secured		
Heavy equipment, such as front end loaders, have been secured		
All work teams issued two-way. communication link Inspection and emergency repairs, if necessary, carried out for all roads, road bridges underwater inspection of foundations and piers Concrete and steelwork		
Inspection and emergency repairs, if necessary, carried out for all buildings and structures of the government (including hospital buildings)		
Emergency inspection by mechanical engineer of all plant and equipment in the District workshop carried out.		
emergency tool kits assembled for each division		
Routes strategic to evacuation and relief marked		
Adequate road signs installed to guide and assist the drivers		
Priority listing made for which roads to be opened first		
Essential equipment such as: <ul style="list-style-type: none"> • towing vehicles, • earth moving equipment, • cranes, etc. made available 		

Begin clearing roads		
Community assistance mobilized for road clearing		
The following activities were undertaken <ul style="list-style-type: none"> • cleaning of ditches • grass cutting • the burning or removal of debris, and • the cutting of dangerous trees along the roadside in the affected area. 		
The following repair works were undertaken for <ul style="list-style-type: none"> • all paved and unpaved road surfaces • pothole patching and • any failure of surface foundations in the affected areas 		
Construction work undertaken for temporary roads to serve as access to: <ul style="list-style-type: none"> • temporary transit camps • relief camps • medical centres 		
Construction work undertaken for temporary structures required for organizing relief work such as: <ul style="list-style-type: none"> • relief camps • feeding centres • medical facilities • cattle camps 		
An up-to-date report of all damage and repairs kept in record		

Inspected By:

Designation:

Signature:

Date:

6.0 PREPAREDNESS CHECKLIST FOR PWD

(to be filled in by the Department Head and submitted to the District Magistrate every six months)

Preparedness measures taken	Y/N	Details/ Remarks
The department has a disaster response plan and/or disaster response procedures clearly defined		
Orientation and training for disaster response plan and procedures accompanied by simulated exercises undertaken Special skills required emergency operations imparted to the officials and the staff		
Preventive measures as recommended in the preparedness and mitigation document of DDMAP are undertaken		
Reviewed and updated <ul style="list-style-type: none"> • precautionary measures and procedures • the precautions to be taken to protect equipment • the post-disaster procedures to be followed 		
All officers are familiar with pre-disaster precautions and post-disaster procedures for road clearing and for defining safe evacuation routes where necessary		
Extra transport vehicles can be dispatched from headquarters		
Arrangements made for securing and covering work under construction heavy equipment such as front-end loaders and can be moved to areas likely to be damaged		
emergency tool kits can be assembled for each division		
Arrangement can be made for the designation of routes strategic to evacuation issuing two-way communication link: to all work teams. Providing essential equipment such as towing vehicles, earth moving equipment, cranes etc, Adequate road signs to guide and assist the drivers.		
Reported By:		
Designation		
Signature		
Date		

ANNEXURE-I

Guidelines for Formation of Disaster Intervention

Teams (DITs)

One of the most important aspects of any DMP is creating a trained work force, which will eventually come to the rescue of the disaster victims as a response to the disaster.

Some Common Elements of Disaster

- Building collapse
- People trapped/injured
- People becoming homeless
- Break down of communication
- Difficult accessibility to the site of disaster
- Animals dead/injured
- Hygiene/sanitation problems

DITs should include -

- Rescue
- First aides, First aid posts, Ambulance
- Fire fighting
- Welfare consisting of
 - Information setup
 - Evacuation expertise
 - Shelter program
 - Clothing

- Food
- Physiological first aid
- Veterinary assistance
- Communication teams
- Police and other paramilitary forces.

The overall common problem of a remote area disaster is that of the tyranny of distance and time which compounds all other factors.

- Resources are usually inadequate with regard to both human and material
- Unpredictable behavior of disasters.

Armed forces - Aid to civil Power

Though Armed Forces are doing an excellent job of Disaster Relief work but according to them (i) this is not one of their main job (ii) machinery used for disaster relief work actually eats into the efficiency of the Armed Forces. (iii) their equipment's take a heavy battering by prolonged use in various disasters and replacement are not easily available. The other major disadvantage with the Armed Forces taking over Disaster Intervention work totally is that it removes accountability of the civil Administration. Preparation of the Disaster Intervention Teams (DITs) is the answer to these problems.

Enrollment of volunteers and training

- For training the district administration should take the help of the SSB setup available in the state to help and assist in carrying out the task of turning out large number of instructors required for in turn training the various DITs.
- environment. If unmanaged an emergency can develop into a disaster (a

Annexure II

"Emergencies may be either natural or man-made. If emergency preparedness is not well planned and well executed an emergency can become a disaster. Disasters are all man-made"

Terms And Definitions

There is no universally accepted or established vocabulary of key words and terms used in the field of 'emergencies' and 'emergency management' although standardisation would be highly desirable. The following terms are in general use but they are not used consistently between or within countries. They are recommended in order to help communication between the various organisations and individuals in Government and non-government organisations concerned with Emergency Preparedness and Disaster Mitigation and Management.

Contingency plans are prepared for dealing with an emergency when it arises. They follow assessments and evaluations of potential threats, emergency impacts, optimum responses to emergencies, and identification of existing resources.

Development is an attempt to achieve long-term improvement in a community and its environment and should include the development of emergency preparedness plans.

Disasters are the occurrence of widespread severe damage, injury, loss of life and property with which a community cannot cope and during which the affected society undergoes severe disruption. They may involve displacement, destruction, adverse environmental effects causing disruption of daily routines, damage to agriculture, and disturbance of local and national economies.

Disaster Management involves activities that stop the situation becoming worse and return life to normal.

Emergency is any situation (which emerges or becomes apparent), human-made or natural, which requires unusual intervention. Emergencies are usually considered to be rapid in onset. An emergency can lead to loss of life, loss of the quality of life, damage to property

or the environment. If unmanaged an emergency can develop into a disaster (a catastrophe or a calamity).

Emergency Preparedness requires the anticipation of an emergency, and actions that prevent it, minimise its possible impact, and reduce the vulnerability of the community of people who might be affected. It is concerned with understanding the threat, forecasting and warning, educating and training officials and the population, establishing organisations for and management of emergency situations including preparation of operational plans, training and education, stock-piling, and ear-marking necessary funds.

Hazard is a potential emergency. It may not be apparent as a possible danger. A hazard may be constant or short-lived such as a 'quiet' volcano or storm clouds. Hazard assessment identifies types, degrees and geographical locations of natural or human-made phenomena.

Impact is the effect of an emergency on an area or community. Intervention is an action intended to change the course of events. Disaster intervention is intended to improve the circumstances of disaster victims.

Mitigation involves long-term measures, formulated during the pre- emergency period, taken to reduce the impact of an emergency. In the case of floods, mitigation could be achieved by flood plain zoning and control, tree planting, land terracing, sand dune stabilisation, and the construction of shelter-belts or windbreaks.

Preparedness is action designed to minimise loss of life and damage, and to organise (before an emergency arises) timely and effective rescue, relief and rehabilitation.

Prevention measures are designed to preclude natural or human-made phenomena from causing or resulting in emergency or disaster situations. Prevention concerns the formulation and implementation of long-range policies and programmes to eliminate the occurrence of emergencies and therefore of disasters. It includes legislation and regulatory measures, principally in the fields of physical and urban planning, public works and building.

Relief is the initial aid response provided by external helpers to those affected by an emergency.

Rehabilitation is the phase of activity following a disaster which includes people returning to work, the permanent repair of infrastructures and damaged buildings, and other actions necessary to help the community to return to normal life as soon as possible. This phase coincides with the period in which emotional recovery normally begins, and allows the population to function at near pre-emergency level. (Americans prefer the term 'habilitation' as the aim may be to improve the standard and quality of life to a level better than that previously experienced by the affected community).

Resource analysis or inventory is a list of personnel and materials available to managers at the time of an emergency.

The **Risk** of a hazard becoming an emergency is the probability of the occurrence of the potential event becoming a reality. The risk may be permanent (e.g. the possibility of an earthquake in the proximity of a fault line in the earth's crust) or occasional (e.g. the movement of a single lorry load of inflammable material which could explode). An off-shore cyclone would be considered a high risk.

Search and Rescue is normally the first activity following a disaster, the aim being to locate disaster victims and to ensure their safety. It includes removing victims from hazardous locations, or evacuating families and whole communities from areas subject to secondary effects of disasters. Search and rescue may have to be preceded by establishment of communications and infrastructures, and followed by clearance of rubble, co-ordination of humanitarian assistance, provision of shelter, life-lines and medical care.

A **Threat** is the situation when a hazard has been identified and assessed on the point of becoming an emergency e.g. a leak being observed on the bund of a tank.

Vulnerable countries, areas, communities or structures are those that might be damaged or affected by an emergency.

Victims are the people affected by a disaster. They are usually capable of making choices and should be consulted about their needs, or provided with counselling to help coping with personal

losses.

Warnings are communications to vulnerable people and emergency managers about conditions that are likely to result in emergencies.

Meteorology, seismology, volcanology and biology play an important role in determining the need for warnings and the prevention of disasters.